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WONDER BOOK
OF THE
WORLD'S PROGRESS
VOL. VII.
HISTORY • PEOPLES

WONDER BOOK OF THE WORLD'S PROGRESS

By
HENRY SMITH WILLIAMS

IN TEN VOLUMES
Illustrated

VOLUME VII

*History
Peoples*



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I

MAN AS PREDATOR

IF that oft-cited hypothetical visitor from Mars were to judge the human race by its record, as ordinarily written in history, his natural conclusion would be that man is by nature a predacious animal. He might even be excused for concluding that the human animal is, of all mundane creatures, the most combative and predacious. For he would find the records of history made up largely of accounts of wars and conquests.

Yet the conclusion, however natural, would be unjust. Man is not by nature a predacious animal. He belongs, biologically speaking, not to the races of killers, but to the races whose very existence is dependent on the development of methods of defense. In the natural state, and left to his own devices, man's thoughts would be directed toward defense and maintenance, not toward the killing of his fellows. How, then, has it come about that the records of history are records of sanguinary contests, in which we find nation attacking nation, battle following battle, with such slaughter as to suggest that in some ages natural death for men meant death at the hands of his fellow men?

The answer, rather curiously, is supplied from the records of animal life—such records as were brought to our attention in an earlier volume. Stated concretely, the basic cause of human warfare, in the ultimate analysis, is the fact that human populations, like other animal populations, tend to increase at a geometrical ratio. A

moment's consideration shows that such increase leads inevitably to the tendency for any group of human beings, during times of prosperity, to spread out in all directions, and thus encroach upon the territories of neighboring groups.

To illustrate: Under normal conditions, it is not unusual for a woman to bear ten children. Indeed, this is rather an understatement of the average potential fecundity of women in general. Under the conditions of savage and barbaric life, no doubt the infant mortality was exceedingly high, and the actual increase of population is not at all to be gaged by the potential increase suggested. Overlooking that point for the moment, however, consider the possibilities of increase of a single pair of human beings.

Ten offspring represent five couples, or a five-fold increase in a single generation. This means that in the second generation there would be twenty-five couples; in the third generation, seventy-five couples; in the fourth, three hundred and seventy-five couples; in the fifth, eighteen hundred and seventy-five couples; and—make the computation for yourself if you doubt it—in the tenth generation, upward of five million couples.

That is to say, the descendants of a single pair of human beings—Adam and Eve if you like—might number upward of ten million individuals at the end of a period of, say, four hundred or five hundred years.

No such increase as this is practically possible, of course, under actual conditions. Yet it is nevertheless true that an enormous increase may take place, and in fact does take place, whenever the conditions of life are reasonably conducive to prosperity. A comparatively small initial group of people becomes presently a very large group. A cluster of villages grows into a compact

and ever-expanding aggregate that is regarded as a more or less homogeneous nation.

And here, naturally, the question of geography enters. So long as there are no geographical barriers to expansion, there will probably be no sharply restricted national bonds. But in reality there always are geographical barriers, and the historical record shows us people of obscure origin developing into groups that we call nations under such restrictions. Thus we find the Egyptians occupying a corner of Africa, shut in by water on two sides and by impossible barriers of desert and tropics on the other sides. We find the Babylonians and Assyrians occupying territory spoken of as Mesopotamia, a fertile region bounded by the rivers Tigris and Euphrates. Off to the east are the Persians, occupying territory not quite so sharply defined; and beyond them the teeming multitudes of India, well shielded by the mountain barrier of the Himalayas at the north and by water on the other sides of their triangular territory.

To the west of Mesopotamia lies the great peninsula of Asia Minor, peopled by Hittites and Israelites and Phœnicians — who never within historic times assume quite the nationalistic importance of the Egyptians or Mesopotamians or Persians, partly because of the lack of sharp geographical lines of demarcation of their respective territories. This restriction, to be sure, does not apply to the Phœnicians, but the territory they occupied was so small that it could not develop a really populous nation; and numbers count in the scale of peoples. Even so, the Phœnicians, thanks to their capacity to reach out across the sea, and notably to establish the great colony of Carthage, attained a position of great influence, and a secure, even if minor, place in history. A glance at the map shows the other great Mediterranean peoples,

the Greeks and Romans, occupying each an amazingly restricted and circumscribed coign of geographical vantage. Each occupies a peninsula, with a mountain barrier at the north. Moreover, the internal territory of each peninsula is largely mountainous; and the territory as a whole is therefore restricted as to its population possibilities.

It appears, then, that the four nations that appear most prominently in ancient history, the Egyptians, the Mesopotamians (Babylonians and Assyrians), the Greeks, and the Romans existed under closely similar conditions, in that each occupied a restricted territory, sharply delimited geographically, and therefore offering no possibility of indefinite increase of population.

That fact, as suggested, is basic. This by itself predetermined that each of the national groups in question should sooner or later find itself under the economic necessity of drawing sustenance from wider territory. And this, stated in practical terms, means that each nation must sooner or later find itself at war with neighboring nations.

And so we read of a time when the Egyptians, under a great leader known as Ramses II, undertook conquests in western Asia, and so far succeeded that the name of Ramses, or Sesostris as the Greek legends called him, passed into history and tradition as a mighty conqueror. The success of his conquest is attested by colossal monuments that are preserved to this day.

In Babylonia and Assyria history repeated itself, and the names of a series of conquerors were legendary throughout classical times, and have become historic through the nineteenth century study of monuments exhumed at the sites of Nippur and Babylon and Nineveh.

The position of the Mesopotamian nations was threatened from the east by the great Persian conquerors, Cyrus and Darius. Presently Persia sought yet wider conquests and the culminating efforts of Xerxes, with his traditional millions of soldiers, to invade Greece and add its treasures to his stores of wealth became major episodes in the history of international relations.

Then we find the Greeks themselves, first colonizing Italy and subsequently sending armies against the rebellious colonies. A little later Macedonia, a northern province of Greece, rises to power under King Philip, who bequeaths to his son Alexander virtual suzerainty over the peninsula, and a spirit of adventure that will not be restrained even within these bounds.

So we find Alexander crossing over into Asia on a marauding expedition, which so well succeeded that throughout subsequent time, until our own, it was to be regarded as the greatest of military exploits. In reality, it was the tour of a brigand, which became heroic in history and legend merely because of the scale of the piracy and its amazing success.

The net result of the conquest, however, was the founding of great colonies in Egypt, and the ultimate shift of Greek civilization, as a world influence, to the south shore of the Mediterranean.

Then came the day when the inhabitants of the Italian peninsula overflowed their bounds in turn; and the piracies of a series of official brigands brought the known world (this side of the far Orient) under dominion of the nation that had Rome for its capital.

There followed a time when the world was said to be at peace, because there remained no one to challenge the martial supremacy of the Roman legions.

But that condition, of course, could not last. Indeed,

it was at best hardly more than a fiction. Presently we find the center of Roman influence shifting to "New Rome," or Byzantium; while the Italian peninsula itself is invaded by one horde after another of barbaric and semi-barbaric nations, sprung from unknown regions of northern Europe and Asia, and seeking an outlet for their overteeming populations, precisely as other and more highly civilized nations had done since history began.

Even in the day when the new seat of Roman Empire, which came to be known as the Eastern or Byzantine Empire, flourished, there were developing rival civilizations back in Asia on one hand, and in central Europe on the other. A blending of Asiatic peoples that came to be known as the Moslem Empire grew and flourished and presently spread westward along the southern shore of the Mediterranean and across the narrow Strait of Gibraltar into Spain and thence into Western Europe.

But there the progress of the Moslems was checked by that other new people, the Franks, who represented a blending of the hordes that had swept into Europe in the later Roman period, and now, struggling toward higher civilization, tho not yet attaining it, had achieved a military supremacy that enabled them to beat back the Saracens, and determined that the future civilization of Europe should be Christian and not Moham-medan.

The empire of the Franks came to a culmination under the greatest of its heroes, Charlemagne, who ultimately had himself crowned at Rome as the lord of the "Holy Roman Empire." That empire was to continue for generations, but with waning power and glory. It was the last of the world empires. While it still existed in name, it had been broken up in reality, through the develop-

ment of localized centers of civilization, which came ultimately to be known as the modern nations of Italy, Germany, France, Spain, Portugal, and the Netherlands.

The intervening period when the growing nations of the West developed a fanatic desire to wrest from the Mohammedans the territory of the ancient Israelites, represents a romantic episode, memorialized in the history of a succession of Crusades; but not quite of the same category with all the other conquests, in that it was not an attempt of an expanding people to gain new places in the sun, but an exhibition of the newer type of piracy, for which the Mohammedans themselves set the example, with a religious instead of economic background.

There followed a period of geographical expansion, an age of discovery, in which the new territories of America furnished an outlet, through colonization, for the surplus populations of the Old World. And of course these new territories gave fresh opportunity for international piracies. The net result has been the building up in the past few centuries of multiform minor groups of nations, which tend perpetually to overflow their bounds and thus give opportunity for international conflicts on a relatively small scale; but which loom large because of their recency.

Only once, under the great military leader who came out of Italy to gain supremacy in France, and ultimately to extend his wars of conquest so widely that he was almost the master of Europe, has there been in modern times anything comparable to the world-empire of imperial Rome, or to the wide sweep of the Holy Roman Empire, which latter the Italian-French brigand — famed as Napoleon I — attempted to revive.

What the conditions are today no one needs to be told. Suffice it only that human populations continue to increase as of yore, and that overpopulation, the historic curse, is still regarded in political circles as a consummation greatly to be desired.

So long as this strange delusion obtains, the history of our race will continue to be what it has been in the past, a record of international struggles, whose net result is to reduce somewhat the population, and therefore, to that extent, to benefit the race.

The time must come, tho long delayed, when even the average intelligence will grasp the idea that there are better ways of reducing populations, and thus keeping nations within bounds, than by wholesale official slaughter. The maxim that prevention is better than cure will ultimately be applied to the national disease of overpopulation as it has already been applied to individual human maladies. But there is nothing in recent history to suggest that that time is near at hand.

In any event, our present concern is not with the future but with the past. On making the analysis just presented, I have spoken rather by way of apology, to explain why it seems necessary, in a survey of the progress of civilization, to devote much space to the story of man's physical struggle with his fellow man, as evidenced in wars and conquests which seem, in their very nature, to negative the name of civilization.

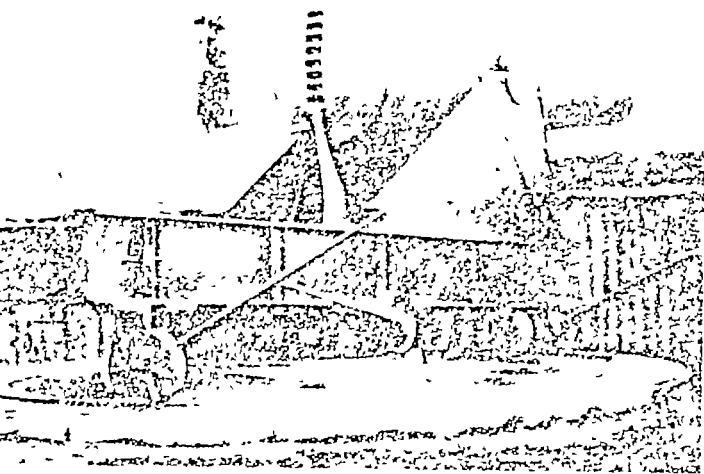
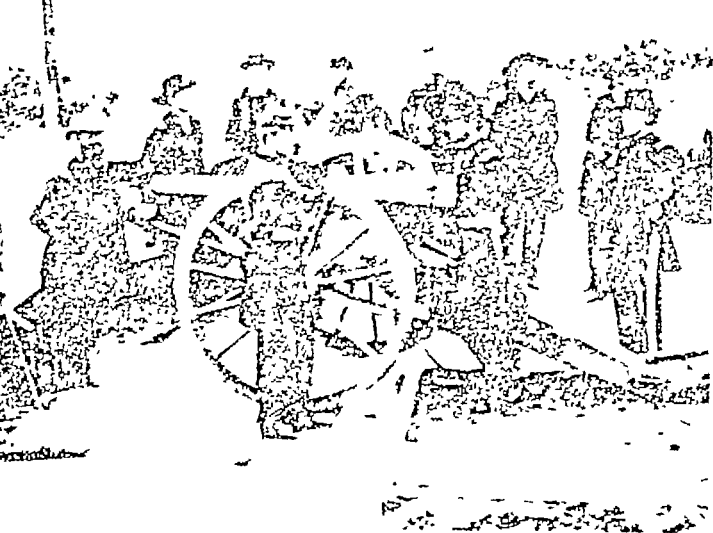
It is the regrettable fact, however, that any record of human progress that ignores this aspect of human relations would be an altogether unbalanced record.

History that told only of intellectual progress would constitute a very inadequate record of the development of human affairs. Each of the great nations of the remote past attained its period of intellectual maturity during

or just subsequent to its time of military supremacy. The relation can not be altogether accidental.

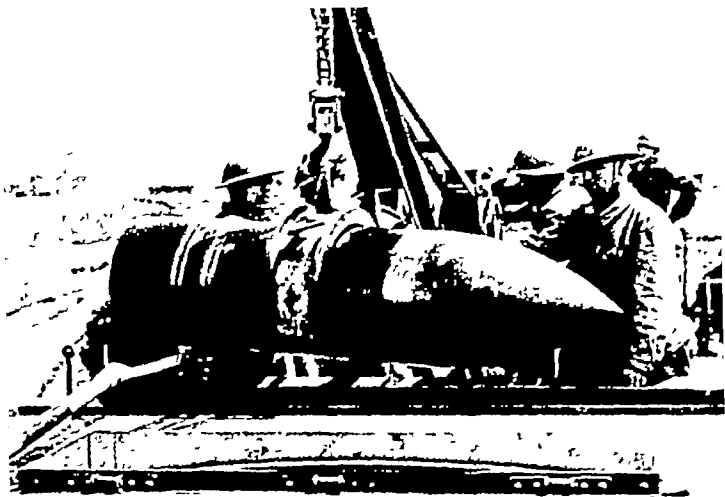
But without stressing that point, or going into further attempted explanation of it, it will be evident that, on the practical side, the military methods of any nation must be conditioned on the stage of intellectual development of the nation. A barbarian of necessity uses the spear, the bow and arrow, the hatchet as his weapons of offense. At the dawn of history, civilized nations had not greatly improved these implements of destruction. As scientific knowledge advanced, the arts of war no less than the arts of peace were modified.

It is the purpose of the present volume to outline the story of this modification of military equipment and methods. Our text will be largely concerned with the early development of the equipment with which man slaughters his fellow man, while contrasting pictures give graphic presentation of the mechanisms through which killing efficiency advanced in more recent times.





WORLD WAR · STACK ARMS — READY FOR ACTION



WORLD WAR BIG SHELL AND BIG GUN



WORLD WAR AIR RAID — DEFENSE BATTERY



WORLD WAR. BOMB DROPPING

II

EGYPTIANS IN PEACE AND WAR

CUSTOMS that differ from our own always seem strange customs. So the Egyptians, viewed from a latter-day European or American standpoint, seem a very strange people. And it being easy to generalize from insufficient data, many notions regarding the Egyptians have become current which appear not to represent that people as they really were. The more the monuments are studied, and the closer we get to the real life of the peoples of antiquity, the less strange these peoples appear.

Indeed, when we come to appreciate their life as it really was, it is surprising how "natural" and human it all appears. Certain peculiarities there were, to be sure, with each people and with each successive age; but in the broad view the peoples of the most remote antiquity are best understood if we think of them as very similar to ourselves in the general sweep of their feelings, desires, and thoughts. The modern Egyptologist has quite dispelled the notion, once prevalent, that the Egyptians were a solemn, morose people, thinking only of the life to come. The truer view, on the other hand, appears to be that they were a peculiarly social, pleasure-loving people. The observance of certain religious rites, which make such an impression upon us because they differ from our own customs in this regard, doubtless did not appear to them to have at all the significance we ascribe to them.

Even in the matters which seem to be most strikingly borne out by the records of the monuments, it is easy to entertain a misconception if one presses too closely the idea that the traits thus discovered belong exclusively to a particular people. Thus in the matter of that conservatism which is commonly spoken of as the predominant trait of the national character of the Egyptians. Conservative they surely were. But so is every other living creature that remains long in a single unvarying habitat.

The basis of civilization is, the conservatism which leads each generation to cling fast to the customs it has inherited. The history of customs, of language, of religions, in short of all culture, shows how tenaciously every people, after a certain stage, has held to the traditions of its past.

It seems as if a people, like an individual species of animal, reaches sooner or later a state of equilibrium in regard to its environment, and will change no further, except as the environment changes. Now in Egypt the physical environment appears to have changed but little within historic times, and the geographical conditions were such that the people there were afforded a high degree of isolation from outside influences. Hence the observed slowness of change in the customs of this "strange" people.

Yet, even admitting all this, one must not, as we have suggested, press the point of Egyptian conservatism too far. The most casual glance along the line of their history shows many notable changes in their radical customs from age to age, even in the relatively short period open to our inspection. There were times when great pyramids and temples were all the vogue, other times when they were quite ignored.

Even the custom of embalming the dead, so striking

a peculiarity, was more or less subject to fluctuating fashions

One must bear in mind that the period of Egyptian history open to our inspection, from the beginning of secure records till the final overthrow and disappearance of old Egypt as a nation, was, according to an average chronology, only about twenty-five hundred or three thousand years.

Now it is an open question whether, for every Egyptian idea or custom that remained even relatively fixed throughout this period, one could not find current to-day among the most progressive nations of the world an analogous idea or custom that could prove at least as long a pedigree. To cite but a single illustration, every civilized nation on the globe today has its whole being as closely bound up with religious observances as was the being of the Egyptian commonwealth. And with a single exception the religious systems in question have held sway over their subjects, substantially unchanged, for a period as long as the entire sweep of Egyptian history under consideration.

Confucianism, Brahminism, Buddhism, Zoroastrianism, Judaism—each is hoary with the weight of something like thirty centuries; each had its origin in an age of superstition which we are prone to think far inferior to our own "enlightened" time; yet each holds its millions of devotees as rigidly and as inexorably as every Egyptian was held by the cult of Osiris. Bearing this single illustration in mind, we shall be able to view the Egyptian "conservatism" more truly as an example of a universal human trait rather than as the peculiarity of a "strange" people.

Altho we have emphasized the view that the Egyptians were very much like other peoples in their funda-

mental traits of character and habits, it must not be overlooked that there is a pretty sharp line of demarcation to be drawn between the customs of Oriental and Western nations, and that the Egyptians were essentially Orientals.

One of the most typical characteristics of the Oriental mind is a deference to authority signalized in the ready acceptance of an autocratic government. Doubtless it never occurred to any Egyptian that he might do away with kings altogether. The conception of the king as the head of the state was so deeply impressed on the mind of the people, that the very possibility of a state without an autocratic head could scarcely be conceived.

But in reading of the extreme deference shown to the kings of Egypt, one is likely to gain a misconception of their actual status. We have been taught traditionally to regard the Egyptians as a meek, peace-loving people, profoundly imbued with religious sentiments, and accustomed to look upon their king as almost a god, and to pay him divine honors. Such indeed was doubtless the fact as regards external and tangible conditions, and no doubt the average Egyptian conceived the kingly authority as something altogether sacred.

But beneath the surface of court life everywhere there is a counter current which the monarch himself can never disregard, however little its existence is recognized by the generality of his subjects.

Professor Erman has emphasized with great astuteness the effect of these hidden influences upon the real life of the Egyptian monarch. He contends that the conditions surrounding the Egyptian court were not different from those about other Oriental monarchs, and he points out with great vividness the distinction between the theoretical and the real position of the sovereign.

Theoretically, the king is absolutely supreme; his will is law, all the property is his; even the lives of his subjects are at his mercy. But practically, the situation is quite different. Old counselors of the king's father are at hand whose bidding is obeyed by the clerks and officials; old rich families must be pandered to; and the priests are an ever-present restriction upon royal authority.

Then there are always relatives who aspire to the throne. Among the large families of Oriental despots it is always something of a lottery as to which child succeeds to power, and there are sure to be mothers who feel that their offspring have been slighted. The familiar stories of the mothers of Solomon and of Cyrus the Younger illustrate the point.

"Even the very potent rulers," says Professor Erman, "were constantly in dread of their own relatives, as was shown by the protocol of a trial for high treason. The reign of Ramses III was certainly brilliant; the country was finally at peace, and the priesthood had been won over by enormous gifts and by temple-building. The aspect of his reign was as bright as could be. And yet there reigned also under him the fearful powers that wrecked each of these dynasties, and it was perhaps due only to a happy chance that he himself escaped. In his own harem treason rose, headed by a distinguished woman of the name of Thi, who was undoubtedly of royal blood, if indeed she were not either his mother or his stepmother.

"Which prince had been chosen as pretender for the crown, we do not know (a pseudonym is given in the papyrus), but we see how far the matter had gone before discovery; twice the women of the harem wrote to their mothers and brothers, 'Arouse the people, and bestir the hostile spirits to begin hostilities against the

king.' One of the women wrote then to her brother, who commanded the troops in Ethiopia, and definitely bade him come and fight the king. When one sees how many high officials shared in the treason or knew of it, one appreciates the danger overhanging such an Oriental kingdom."

It will be well to bear this corrective view in mind in considering the position of the Egyptian king as suggested by the monumental inscriptions and pictures. But this view does not at all alter the fact that the people at large were absolutely subservient to the idea of kingship. Certain individuals might strive to overthrow any particular monarch, but it was only that they might set up another. The idea of doing away with monarchy itself never entered their heads. That idea was born upon European soil, long after the power of ancient Egypt had departed.

It is an easy step from monarchs to armies and war methods, altho in Egypt the relationship was not so close and intimate as in the case of many other nations. The Egyptians were not preeminently a warlike people, yet, first and last, war entered very largely into their life history, as with every other nation, and there was one period under the New Kingdom when the Egyptians became a conquering people. As the chief monarch of this epoch, Ramses II, was greatly given to recording his own deeds in monumental fashion, very full data are at hand for interpreting the war methods of the people during this epoch.

There is nothing unique about these methods. The Egyptian army consisted principally of militia armed with bows and javelins. The cavalry, consisting of companies of charioteers, was led by the king himself. Equestrianism had not yet entered into warfare. In sieges,

III

GREEK WARFARE

OUR knowledge of the methods of fighting employed by the Greeks is fairly comprehensive. There is here little need of conjecture as to methods of attack and defense, or of weapons used, as Greek writers and Greek sculptors have left us indisputable evidences of how their countrymen won and lost their battles. Even the very ancient methods are fully known; and from these primitive and semi-barbaric ones we have the complete record of the steps of development through the various transitions to the almost perfect fighting machine employed by the master-general, Philip of Macedon, and his son Alexander the Great.

At the time of the Trojan war (1193-1184 B.C.) the weapons used by the Greeks were made chiefly of bronze. These weapons were the spear, the javelin for casting, the sword, slings, and bows and arrows. The last were only carried by soldiers of inferior courage and rank, being regarded as weapons beneath the dignity of tried soldiers and officers. This was not the case with the Trojans, however; with them the bow was a favorite weapon, used by even the highest officers. At this time the Greeks had no cavalry, but still employed crude two-wheeled chariots for rapid maneuvering, altho the actual fighting was not done from them, the chariot soldier descending and fighting on foot when he came within striking distance of the enemy.

The principal body of soldiers fought in a phalanx--

a deep body of men standing shield to shield, the lances of the foremost columns advanced toward the enemy. This phalanx was of very ancient origin and was apparently known from the earliest times, tho it should not be confused with the later Macedonian phalanx perfected by Philip II and used so effectively by his son Alexander the Great.

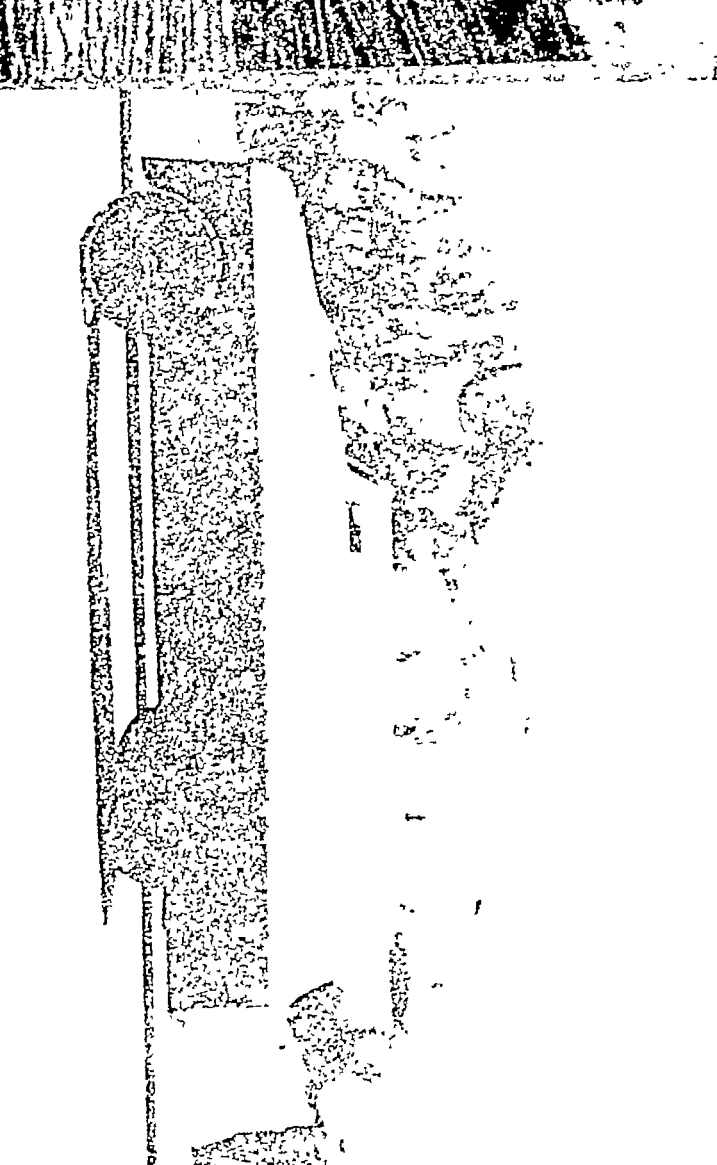
Entrenched camps also were known at a very early period. These were usually circular in form with a deep ditch or wall of dirt and rude palisades. Very little was known of siegecraft, which became such a highly developed art later, even the famous siege of Troy itself being in the nature of a partial blockade.

The infantry was divided into two classes of soldiers, the heavy and light, called hoplites and psiloi, respectively. The heavy infantrymen were armed with spears ten feet long, short swords, and large shields. Their protective armor was helmets, breastplates, and greaves, sometimes made of leather and at other times of metal, or leather studded with metal at certain points. The light troops were armed with bows and slings and wore no protective armor.

Even at an early period the Greeks had a considerable knowledge of tactics. The light troops were disposed along the front flanks of the army and the heavy infantry formed a phalanx in the center. The soldiers were courageous and well disciplined, but at this period extremely superstitious and cruel, their superstition frequently interfering with their fighting qualities, and it was not until the time of Epaminondas that tactics were introduced that turned these natural fighting qualities to full account and overcame some of their peculiar superstitions.

Altho the early Greeks made war their chief occupa-





This distrust of horsemen was heightened by the experiences of the Persian war. The Persians fought on horseback and made constant use of cavalry, while the Greeks fought on foot, seldom using their horsemen; and the footmen usually won. It was but natural, therefore, that the infantry was preferred.

For this reason the Greeks, after the successful Persian campaigns, while giving some attention to the further development of their cavalry, concentrated their efforts on improving their most powerful battle formation, the phalanx. This formation had answered its purpose so well that they sought only to improve it rather than change it. While these improvements were still in progress, the Peloponnesian war furnished an opportunity of again testing the efficiency of the phalanx, this time against a different type of soldiers. The result was an increased confidence in this formation.

The phalanx of that period was still of the olden type. "The unit was no longer decimal," says Dodge, "but founded on the powers of the number *two*. The depth of the phalanx was rarely less than eight or more than sixteen men, tho it was on rare occasions made so light as four, or so heavy as twenty-four. Epaminondas made a column forty-eight men deep at Leuctra and Mantinæa, but this was not the phalanx proper. Generally the eight, twelve, or sixteen deep file was in use. Xenophon puts the average at twelve.

"By employing any number of files under a leader, any convenient unit of organization could be made, or detachment formed. The leader stood in front and there were a number of file-closers to keep order in the ranks. The larger divisions of the phalanx had their ensigns and trumpeters, and each leader had near him one or two men to convey or repeat his orders.

"Maneuvers were made in measured step to the sound of fifes. The cadenced step was essential to preserve order in a phalanx with twelve-foot pikes. The pike was practically the only weapon used so long as the phalanx held together. The foremost ranks protended their pikes; the rear ranks leaned them forward on the shoulders of their leaders to break the flight of arrows, or held them erect."

The order of formation of the Greek army was in parallel, sometimes with one or both wings strengthened, the aim of such a formation being to strike the enemy all along the line at the same time. This order was used with various modifications for striking or surrounding the wing of an enemy's army, but was much less effective than the oblique formation which was improved by Epaminondas. In this formation one wing was materially strengthened and was sent first against the opposing wing of the enemy, the other wing advancing more slowly, thus presenting an oblique front.

The strong wing, advancing first, was almost sure to throw the enemy's ranks into confusion, and the remaining troops coming close behind the first wing, and in good order, could complete his demoralization. Making use of this oblique order was a distinct advance in military tactics, and, as used by Epaminondas, is considered by some modern tacticians as "the greatest advance in battle tactics ever made at one step."

To the military genius of Philip of Macedon was due the development of military system with which Philip's son, Alexander the Great, effected his conquests. At the time of the accession of Philip, the Macedonian infantry was composed mostly of shepherds clothed in skins and armed with ill-assorted weapons. As an army it had no organization. The cavalry were somewhat better equip-

ped than the infantry, but could hardly have been called a well organized body. One of the first steps taken by Philip was to organize a definite military system, upon which later he developed a standing army numbering forty thousand men. This organization was not materially changed by Alexander, but rather expanded to meet the requirements of the growing state.

But Philip's great stroke of genius was his introduction of the long spear, or *sarissa*, which made possible his invincible phalanx. His carefully drilled and strictly disciplined soldiers presented a compact front of bristling spear points that for years proved absolutely invulnerable. Against such a formation the Athenian and Spartan phalanx could make no stand, as its shorter weapons were all but useless when opposed to Philip's long sarissas, which cut down their first and even their second rank before the Spartan soldiers could get within striking distance.

Thus the simple lengthening of the most primitive of weapons played an all-important part in determining the supremacy of the civilized world. Fifteen hundred years later the lengthening of another primitive weapon, the bow, as we shall see later, was an important factor in determining the supremacy of England.

But just as the skill in handling the longbow was as necessary to success as the weapon itself, so the skill in handling the *sarissa*, and the discipline necessary to manipulate the phalanx armed with such a weapon, must come in for a full share of credit. In this, as in the original conception of the use of the long spear, Philip showed his genius.

The following description of this phalanx, as given by Grote, shows what a complicated machine it was:

"The phalangites were drawn up in files generally

sixteen deep, each called a lochus; with an interval of three feet between each two soldiers from front to rear. In front stood the lochage, a man of superior strength, and of tried military experience. The second and third men in the file, as well as the rearmost man who brought up the whole, were also picked soldiers, receiving larger pay than the rest.

"Now the sarissa, when in horizontal position, was held with both hands (distinguished in this respect from the pike of the Grecian hoplite, which occupied only one hand, the other being required for the shield), and when so held it projected fifteen feet before the body of the pikeman; while the hinder portion of six feet was so weighted as to make the pressure convenient in such divisions. Hence, the sarissa of the man standing second in the file projected twelve feet beyond the front rank; that of the third man, nine feet; those of the fourth and fifth ranks, respectively, six feet and three feet.

"There was thus presented a quintuple series of pikes by each file, to meet an advancing enemy. Of these five, the three first would be of decidedly greater projection, and even the fourth of not less projection than the pikes of the Grecian hoplites coming up as enemies to the charge. The ranks behind the fifth, while serving to sustain and press onward the front, did not carry the sarissa in a horizontal position, but slanted it over the shoulders of those before them, so as to break the force of any darts or arrows which might be shot overhead from the rear ranks of the enemy."

The impact of this phalanx with the soldiers in the rear pressing against those in front, was terrific, and as used by Philip and Alexander, practically irresistible. The discipline in handling such a closely packed body of men was necessarily very strict, and it was an offense

of great gravity for any member of the phalanx either to lag behind or to advance faster than any of his companions.

Owing to the athletic training of the individual members of the phalanx, it was a more flexible, or rather, perhaps, a less unwieldy body, than might be supposed. The soldiers were trained to change from front to rear quickly, or to present a double front if attacked on both sides simultaneously. They were trained also to form a covering for themselves with their overlapping shields, this covering being so compact that the Macedonian slingers and archers sometimes marched over it or stood upon it while they discharged their missiles, without disarranging the ranks.

In one of Alexander's battles the enemy suddenly rolled their chariots down a hillside upon the phalanx. But so complete and firm was the shield-covering of the phalangites, who crouched beneath them at the word of command, that the chariots passed over them without either breaking their ranks or seriously injuring any member of the phalanx.

It is obvious, however, that such a compact and at best unwieldy body as the phalanx could not alone form an effective army. It might form the bulwark of a fighting mass, but must, at the same time, have aids and auxiliaries to protect it against attacks of an enemy who refused to charge or to withstand a charge, and who by keeping out of range of the spear points could hurl light weapons into the phalanx and eventually destroy it. Bodies of lightly clad archers, or horse archers, by circling about or keeping constantly in retreat before the advancing line of sarissas, could exhaust and finally destroy such an unsupported body. To provide against such a contingency Philip gave much thought to the

development of his lighter troops, more especially the cavalry. And his son Alexander improved still further this branch of the service, until his cavalry became almost as famous as his phalanx. He used a larger body proportionately than was ever used by any preceding commander.

This cavalry marched in columns of fours, and formed a solid square of eight men on each front to charge in small bodies. Sometimes it was formed in triangular bodies and as such charged with the apex or base as front, as the occasion demanded. Again it was formed in a square or lozenge-shaped mass, this formation having the advantage that it could charge in any direction, always with the same number of men in front.

The cavalry was divided into classes, the principal one being the heavy Macedonian horsemen, all of them picked men and each of them accompanied by a mounted servant. These soldiers were armed with long spears and swords, were clad in complete scale armor and metal helmets, and carried shields. Their horses also were partly covered with scale armor, worn as a headpiece completely covering the head and extending part way down the neck, and a breastpiece extending across the breast and reaching back as far as the girth.

Besides this heavy cavalry there were light horsemen who wore light defensive armor and shields and who fought sometimes as cavalry and sometimes as infantry. They were really mounted infantry and were employed largely as skirmishers for opening the battles and in pursuing the broken enemy. All horsemen rode without stirrups, and their horses were unshod. A simple blanket was used in place of a saddle, and the riders drilled constantly in exercises that tended to give them a firm seat.

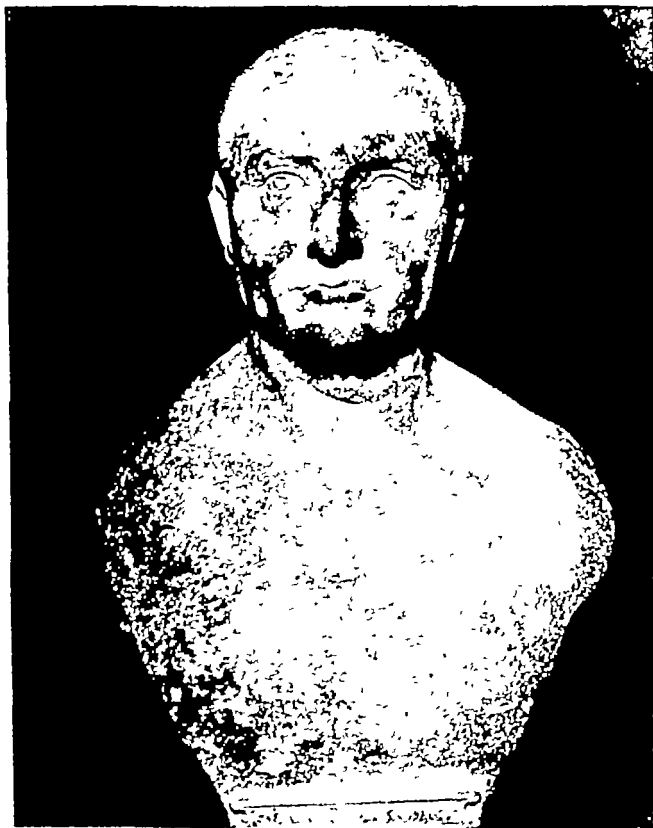
The Macedonians used several different kinds of

engines for throwing heavy missiles—their “artillery.” These were improved and brought to a high state of perfection by Philip, but were only used by him in besieging. But Alexander turned these military engines into field artillery by mounting them on wagons. The two principal types of engines were the catapult and the ballista. The catapult was simply a huge crossbow mounted on a platform, but the propelling force, instead of being derived from the elasticity of the wood as in the case of the ordinary bow, was obtained by twisted cords or rawhide, fastened to arms that corresponded to the ends of a bow. A huge cord was used for a bowstring, which was drawn back by means of a windlass. This catapult shot iron bolts, or arrows, weighing as high as three hundred pounds. The range was from a quarter to a half a mile, and for the shorter distance it could be discharged with considerable accuracy.

The ballista was an engine for hurling stones and heavy missiles. It was constructed of a long, strong beam, with a spoon-shaped cavity at the end, pivoted so as to work in much the same manner as the hammer of a modern gun. Pulling it back into place was like cocking a great gunlock, and when thus pulled back by the windlass it was held in place by a catch, ready for discharging when the stone had been placed in the bowl-shaped receptacle at the end of the beam. The motive power was obtained in the same manner as in the catapult, by twisted cords or gut.

When released from the catch, this beam flew up against a cross-bar like a triphammer, the stone being projected a maximum distance of about half a mile. By adjusting the position of the cross-bar the projectile could be shot with considerable accuracy, and it could be discharged quite rapidly. The missiles thrown by such

weapons were not confined to stones, but included red-hot metal, fire balls, and even decaying corpses, for spreading diseases among the besieged. For then, as now, disease was the most dreaded of all enemies



SCIPIO, CONQUEROR OF HANNIBAL

IV

SIEGES AND SIEGE DEVICES

SOMEONE has said that, barring their lack of the knowledge of gunpowder, the ancients were as fertile in resources as we are today in the matter of sieges. The fortresses of the Egyptians, Assyrians, Greeks, and Romans were apparently as well fitted to resist attacks as any fortifications ever built until the introduction of modern iron and steel plates. And the Greeks were certainly the equals in siegecraft of any other ancient or medieval nation. For in Western Europe, during three or four succeeding centuries following the fall of the Western Roman Empire in 476 A.D., the fortifications used were mostly palisaded mounds of earth with possibly a stone structure in the center, which could have been quickly destroyed by the great war engines of an Alexander. Indeed it may be seriously questioned if any Western European nation ever excelled, if indeed any ever equaled, the methods of the later Greeks in attack and defense until the introduction of gunpowder.

The most primitive method of attacking walls was, of course, by the use of scaling ladders. The Greeks used a great variety of such ladders, from simply straight poles which were placed against the battlements and climbed sailor fashion without the use of cross-bars, to most complicated structures. The use of the simpler form was probably confined to secret night attacks at an unguarded point in the wall. Some of these were heavy poles with hooks at the end for grappling the wall,

studded with several rows of spikes, very much like the modern fireman's scaling ladder. Many of the heavier ladders were constructed wide enough so that several men could mount abreast, thus rendering the attack more effective, and also increasing the weight of the ladder so that it was harder for the besieged to push it from the walls. These heavy ladders were frequently mounted on boats for attacking sea walls.

To resist attacks by scaling parties, various engines were constructed on the walls, with which the ladders were either pulled up over the battlements, broken, or pushed away. But at best the method of attacking a wall with ladders was feeble and ineffective if the parapets were well manned.

A much more effective method of scaling a wall, sometimes used, was by means of what is known as the "tortoise." To form this "tortoise" a body of soldiers held their shields above their heads, supporting on them a second body of soldiers in a similar formation, and these in turn supporting other soldiers who attempted to reach the top of the wall. Obviously this method of attack could only be directed against comparatively low fortifications, and was only used where the engines for battering the walls were unavailable, or in an attempt to take an enemy by surprise. Of these engines for destroying the walls the battering ram and the bore were the most effective and continued in use until the introduction of gunpowder.

The first battering rams used were simply metal-shod tree trunks impelled by a line of men who rammed them against the walls by moving rhythmically back and forth. Later this ram was suspended by ropes or chains to a cross-bar held on uprights, and still later it was suspended from movable or stationary towers which afforded pro-

tection to the men working it. This form of structure was the stepping-stone to the later movable towers, which were sometimes many stories high. Such structures were provided with drawbridges worked on hinges, which could be thrown against the wall, allowing the soldiers in the towers to attack the men on the battlements while the ram pounded the rocks at the base.

Some of the later Greek battering rams were of enormous size. They were constructed of the entire trunk of the largest tree obtainable, heavily loaded at both ends to increase the force of the blow, and weighing a hundred tons or more, according to some authorities. Diodorus tells of one of these rams which was manipulated by fifteen hundred men working in relays. To transport this particular ram required three hundred pairs of horses.

The bore was simply a pointed ram—a tree-trunk shod with a metal point instead of a blunt end. It was mounted and operated in the same manner as the ram, and was used most effectively against walls built of rubble or small stones. Both of these weapons, however, were frequently used simultaneously, sometimes mounted in the same tower.

The towers containing the rams were usually set up some distance from the walls, out of range of the enemy's missiles, and when completed were gradually rolled into place. If the wall to be attacked was surrounded by a ditch it was necessary to fill this in with dirt and stones before the ram could be rolled into position. At other times the structure to contain the ram was built within striking distance of the wall itself, the soldiers protecting their working comrades with showers of stones, arrows, and javelins.

Meanwhile the besieged erected various engines on

the walls to destroy the rams or to lessen the effect of their blows. A favorite device for this purpose was a kind of tongs or grappling iron which was lowered so as to seize the ram and pull it over the ramparts. This was only effective, of course, against the lighter types of rams. To disable the heavier rams a common method was to use a huge forked beam, which was dropped over the protruding end of the ram, fixing it and preventing its being drawn back for the blow. But besides these more difficult methods of disabling the rams, masses of stone were dropped upon them, or hurled against the towers above them, and attempts were constantly made to burn the structure or to drive off the workmen with firebrands, red-hot metal, hot oil, boiling water, or hot sand.

Simultaneously with these attacks of the rams, the besiegers attacked the defenders from behind large shields or movable mantlets, with javelins, bows and arrows, and slings. These mantlets were made of framework mounted at such an angle that the men behind them were afforded complete protection from the missiles thrown from the walls. The frames were sometimes covered with hides and at other times with tiles or clay. The lighter ones afforded protection only for a single soldier, while some of the heavier ones were large enough to contain three or four.

Diades, the engineer of Alexander, was the inventor of a great hook or "crow" mounted on a swinging beam, similar to that of the ram, which was used for grappling the tiers of stones at the top of the wall and pulling or "clawing" them to pieces. This crow was very much like the hook used by modern firemen for pulling down walls, but being suspended from uprights it was easily swung into position for repeated attacks upon the wall.

Diades also invented an immense crane with which a car, containing several soldiers could be swung into position on a level with the defenders on the walls or in the towers.

Another very ancient method of attacking walls was by mining. If the fortress was situated upon a rock, or was surrounded by a deep moat, mining was impossible; but where the walls rested upon ordinary soil attempts were made to hollow out the ground beneath them. This cavity was then filled with combustibles and fired. As the temporary wooden supports burned away, the wall would crumble and fall. Frequently the entrances to these mines were begun at some little distance from the walls, and in a position not likely to be detected by the besieged, and the work of excavating only carried on at night. If the enemy detected the mine before it was complete, they dug countermines, and either attacked the workmen from within, smoked them out, or expelled them by some other means. All things considered, mining was perhaps the form of attack most dreaded by the defenders of a besieged city or fortress.

V

GREEK AND ROMAN VESSELS OF WAR

IN the main, a description of the Greek war vessels will answer for the Roman as well, as there were few points of difference, the Romans simply copying the models of their predecessors. Their methods of attack with their war ships differed somewhat from the Greeks, but in construction, shape, and method of handling, the two were practically identical.

While the Egyptians and Phenicians were probably the first navigators and shipbuilders of antiquity, our knowledge of ancient shipbuilding is almost entirely due to Greek sources, most of the earlier records having disappeared. The Greeks came naturally by their love of the sea. The topography of their country tended to develop a race of mariners, the numerous indentations of the sea into the Greek peninsula affording an unusually large number of natural harbors, available for light-draft vessels. And we know that even at a very early period they had learned to construct vessels with double decks, with forecastle and quarter decks, in this respect not unlike the sailing ship of a century ago. This seems the more remarkable when it is recalled that even in the time of Columbus, and for many years after, only decks of the most primitive character were in use. Rudders, also, were used by the Greeks at an early period. These were not ordinarily used singly, as in modern vessels, but in pairs fastened together so as to act in parallel.

The Greek merchant ship had a beam one-quarter its

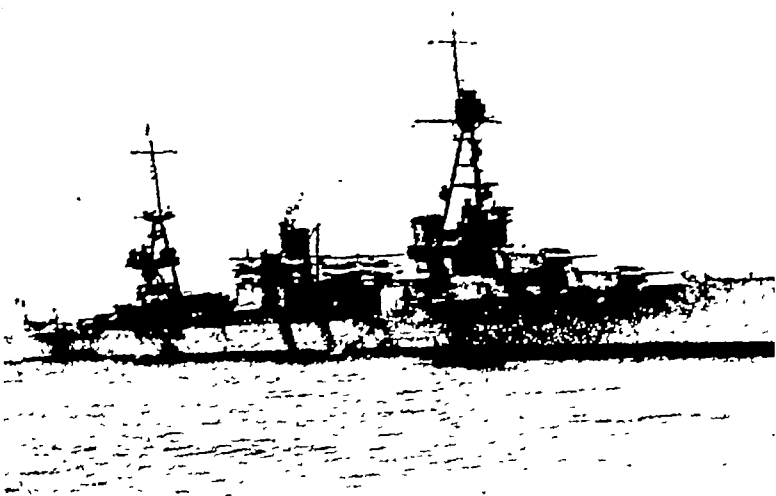
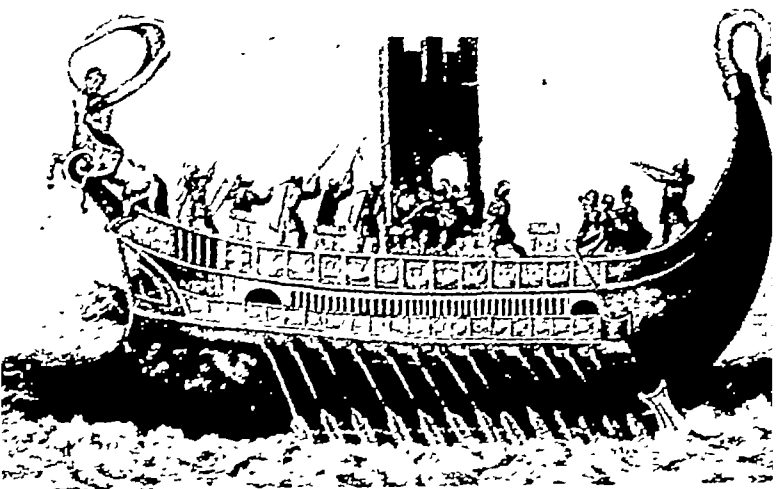
own length, but the war vessel was longer and narrower, the beam being one-eighth or one-tenth of its length. Ordinarily the trireme—a name originally applied to vessels with three tiers of rowers, but later used as a generic term for all war vessels—was about one hundred and fifty feet long by fourteen feet wide at the water line, and about twenty feet deep, with a draft of eight or nine feet. Such a boat had a displacement of about two hundred and thirty tons.

Vessels were propelled both by sails and by oarsmen. These oarsmen were seated either in single rows, or in double, treble or more "banks." The state ship built by Ptolemaios Philopator had forty such banks, the uppermost oars, necessarily the longest, being fifty-seven feet long.

Despite this use of oars, the use of sails was fairly well understood by the Greeks. Their ships were single, double, or triple masted according to size, the main mast standing in the middle of the vessel, held in place by ropes. It was square-rigged, carrying course and topsail, above these being a top-gallant sail, and sometimes two small triangular sails. The smaller masts were rigged with fore-and-aft lateen sails.

The use of two or more ranks of rowers necessitated a peculiar arrangement of the oarsmen, and the numbers of these ranks determined the names of the types of vessel. Those vessels with three ranks were called triremes, those with four quadriremes, those with five quinqueremes, and so on, altho, as just stated, the word "trireme" was frequently used generically as applied to any war vessel.

"The rowing apparatus was confined to the center part of the hull," according to Hueffer. "Poop and prow were unavailable, owing to their narrowness, and the



ROMAN AND AMERICAN WAR SHIPS

former supposition of the uppermost rank of rowers having sat on deck has been completely abandoned, as have also the opinion that the space for the rowers was divided by horizontal partitions of any kind. The space for the rowers was closed on the one hand by the long sides of the ship, on the other by two vertical partitions, with openings in them through which the rowers filed off to their seats. The benches, reaching from the diaphragm to the side of the vessel, were arranged in rows of different heights.

"Owing to the outward curvature of the hull, the rowers in the lower ranks naturally sat nearer to the side of the vessel than those in the higher. The width of seat necessary for each man may be counted at eight square feet. The benches were arranged so that the seats of the upper row were on a level with the heads of the lower. The ranks, in a manner, were dovetailed into each other, in consequence of which the handles of the oars in one row required to be only two feet lower than those in the row above it. This arrangement, which left sufficient freedom to the movements of the rowers, explains why, in many-ranked vessels, the oars of the upper rows need not have been too long or too heavy to be plied by one man only.

"For Greek ships, unlike medieval galleys, had only one rower to each oar. In order to make this possible, the oar was balanced, the weight of the part inside the vessel being increased by the thickness of the handle and additional pieces of lead, so as to make it quite as heavy, or even a little heavier, than the outer part. Besides this, the aperture for the oar was bound with metal, so as to reduce the friction to a minimum. The force of the beat of the different banks of oars on the water was made equal through the proportion of the inner to the outer

part of the oar being in the same proportion in all oars."

A great number of oarsmen were required to manage such ships, the ordinary trireme carrying one hundred and seventy-five rowers, every additional rank adding at least one-third more to this number. Besides the rowers were the sailors for handling the sails, but there were relatively few of these, as the maneuvering of the vessel in battle was dependent upon the oarsmen rather than the sails.

In fighting with these vessels the Greeks depended largely upon their skill in ramming and sinking the enemy, or in crushing his oars and disabling him. The number of marines, therefore, was comparatively small. The fighting tactics of the Romans were entirely different. While adopting types of ships similar to the Greeks, they used them as floating fortresses, and not merely for ramming an enemy. The decks were filled with fighting towers and bridges for boarding, catapults, and other engines for hurling missiles.

Thus the Romans simply transferred their land fighting methods to the decks of their war vessels. The unwieldiness of such craft, however, led finally to their abandonment and they were replaced by bireme vessels, or galleys. This type of fighting boat remained the popular one throughout the early Middle Ages and until the introduction of firearms.

The superiority of this little craft was demonstrated in some of the Roman battles where, in the battle of Actium, the light galleys completely outmaneuvered the heavier type of vessel, destroying many of them and disabling many more, without receiving any material injury in return.

Those familiar with the speed of the modern racing shell will readily understand that the Greek and Roman

vessels, long, narrow, and beautifully modeled, when propelled by hundreds of rowers, aided by a considerable spread of canvas, could attain great speed. An example of this is shown in a voyage made by Balbius, who went from Messina to Alexandria in six days. The time required for this same trip by the French mail steamers of forty years ago was six and one-half days.



A GREEK HELMET

PHENICIAN CIVILIZATION

EGYPT and Babylonia were doubtless the greatest nations of remote antiquity, but Phenicia was in some respects more wonderful than either. Here was a people occupying a tiny strip on the coast of the Mediterranean, its total population aggregated in a few scattered cities, yet, actuated by a common impulse, reaching out east and west, north and south, to the very limits of the known world, and weaving with its trading ships and caravans a web of unity between all the civilized nations of the eastern hemisphere.

Phenicia itself was at most something like one hundred and fifty miles in length, and in width it varied from literally a few yards to at most thirty-five miles. But the territories that paid tribute through the merchants and explorers whose home was in this tiny center, were as widely separated as India on the one hand and the Atlantic islands off the west coast of Africa on the other.

The Phenician explorers sailed far out beyond the Pillars of Hercules, which for every other nation of antiquity represented the westernmost limits of the known world. Northward the Phenician commerce stopped only with the confines of civilization, and southward, on at least one occasion, the adventurous explorers went far beyond it, actually circumnavigating Africa—a feat which was not repeated by their successors for two thousand years.

This circumnavigation of Africa has been questioned, and, indeed, it must be admitted that it rests on rather scant evidence, as we have nothing for it but the authority of Herodotus. But it chanced that in the tale which Herodotus tells he unconsciously bears witness to the truth of the narrative, when he relates that the explorers claimed to have sailed into a region where they had the sun on their right; that is to say, to the north. Herodotus himself does not of course at all comprehend the meaning of this statement. Yet, as moderns view the matter, it is clear that this statement in itself is practically a demonstration that the explorers at least did go beyond the equator, and this being the fact, it seems not unreasonable to credit their claim to have made an entire circuit of the continent.

The Phenicians were not conquerors except in a commercial sense; but as the traders of the ancient world they were the means of spreading civilization to a degree unequaled by any other nation. In particular they colonized the Mediterranean; and they were credited, no doubt justly, by the Greeks with having introduced at least the elements of Egyptian and Babylonian culture to that nation. Their most famous feat in this direction was of course the introduction of the alphabet, which, as the traditions of the time relate, and as modern scholars are quite ready to believe, the Phenician traders brought with them from the Orient.

As to the exact origin of this alphabet, modern scholars are still somewhat in doubt. The Greeks themselves ascribed its origin to the Egyptians, believing that the Phenicians had adopted a modified alphabet from the hieroglyphics. There were others, however, among the ancients who ascribed the origin of the Phenician alphabet not to Egypt, but to Babylonia, and curiously

enough this discrepancy amongst ancient authorities is exactly matched by the discordant opinions of the scholarship of our own day. It is admitted on all hands that the Phenicians did not themselves invent their alphabet. But whether the foundation upon which they built it was the hieroglyphic or hieratic script of the Egyptians, or the elaborate cuneiform syllabary of Mesopotamia, is not even now clearly established.

The theory of Egyptian origin found about the middle of the nineteenth century an able and strenuous advocate in the person of Viscount de Rouge, who elaborated the theory which specifically accounted, or attempted to account, for the different letters of the Phenician alphabet as of Egyptian origin. He based his comparisons not upon the hieroglyphics, but on the modified forms of the hieratic script, believing with good reason that the Phenicians obtained their alphabet at a very early date—perhaps something like 2000 B.C. He logically confined his analysis to an observation of the oldest specimens of the hieratic writings that were accessible, in particular using the Prisse Papyrus, which, as good fortune would have it, chanced to be written in a very clear, bold hand.

This hieratic script, as is well known, follows the hieroglyphics themselves in using at once an alphabet, a syllabary, and a modified form of ideographs. It is one of the most curious facts in the history of human evolution that the Egyptians, having advanced through the various stages of mental growth necessary to the evolution of an alphabet, should have retained the antique forms of picture writing and of syllabic representations of sounds after they had made the final analysis which gave them the actual alphabet, and that to the very last they should have used a jumble of the various forms of representations in all their writings.

The feat of the Phenicians, according to the theory of De Rouge, was to select from the Egyptian characters those that were purely, or almost purely, alphabetic in character, and, recognizing that these alone were sufficient, to reject all the rest. Simple as such a selection seems when viewed from the standpoint of later knowledge, it really must have required the imagination of the most brilliant genius to effect it.

The theory of De Rouge was so ably supported through comparison of the most ancient known inscriptions of the Phenicians with the hieratic alphabet of the Egyptians that it was almost at once accepted by a large number of scholars, and for many years was pretty generally regarded as having solved the old-time puzzle of the origin of the Phenician alphabet. More recently, however, the theory of De Rouge has been called in question and the old theory of Pliny, which ascribed the origin of the alphabet to the Babylonian script rather than the Egyptian, has been revived by modern archeologists.

Professor Deecke attempted to derive the Phenician alphabet from the later Assyrian. This attempt, however, has been characterized as refuting itself in the very expression, for it can hardly be in question that the Phenician alphabet was in use long before the later Assyrian came into existence. A more logical attempt, however, has been made to draw a comparison between the Phenician and the ancient Accadian, which was the classical speech of Mesopotamia and the model on which the later Assyrian itself was based. This theory, first suggested perhaps by Professor Wuttke, found an able advocate in Dr. J. P. Peters, and more recently has been sanctioned by the high authority of Professor Hommel. Their opinions on the other hand have been ardently

combated by the advocates of the theory of De Rouge, and the subject is as yet too obscure and the data are too few for a final decision.

Whether the Phenicians went to Egypt or to Mesopotamia, however, for their model, it is at least admitted on all sides that among this people originated the alphabet which was transmitted to the Greeks, and through the Greeks to all modern European nations. This fact should of itself suffice to give the Phenicians a foremost place among the nations of antiquity.

It is a curious fact that the nation to which all Europe owes its alphabet should have been the one which has left us the fewest written records of all the great nations of antiquity. It is not at all in question that the Phenicians first developed a purely alphabetical script and transmitted it to the Greeks, yet there are no written monuments of Phenicia herself preserved to us that are as ancient by some five hundred years as the oldest records of Greece, that have been found in the ruins of her so-called Mycenæan period.

Indeed, the oldest records of Phenician life, at present known, do not come from the territory of Phenicia proper, but from her colonies. This anomaly has been explained by saying that the Phenicians were not essentially a monumental people. They were seemingly but little solicitous to preserve records of their national life, the reason being, no doubt, that such records among the early nations were almost solely actuated by the desire of a great conquering monarch to preserve the memory of his own fame. As Phenicia had no great conquering monarchs, as her conquests were all peaceful ones, lacking the element of dramatic picturesqueness, there was no one who had a personal interest in engraving inscriptions to tell her story to posterity.

Even so great a feat as the invention of the alphabet was probably looked upon by the Phenicians as more or less a natural development growing out of their contact with Egypt and Babylonia. And, indeed, it is not through the Phenicians themselves, but through the Greeks, that we are informed of the fact that our alphabet is of Phenician origin.

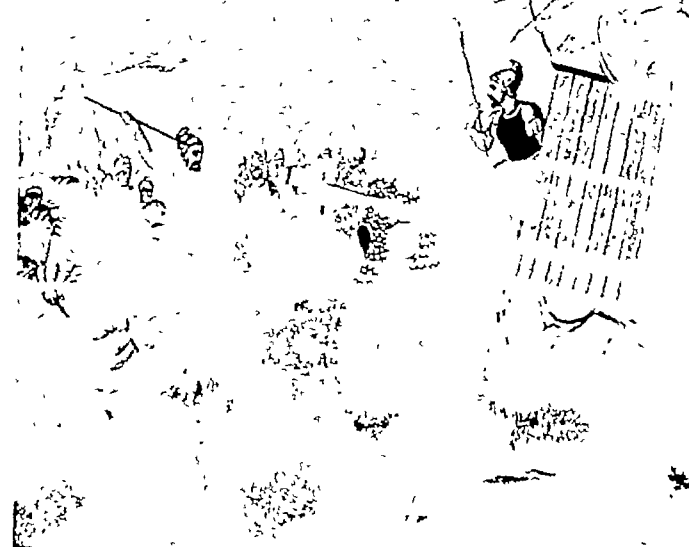
So far as one is able to picture the actual manners and customs of the Phenicians, in the period of their greatest power, one must think of them essentially as a matter-of-fact manufacturing and commercial nation, living in a few relatively large cities, and sending out colonies from these cities whenever the growth of population made such extension seem necessary. Sidon and Tyre were alternately the cities of greatest influence, but neither one apparently was at any period a really great city as regards actual count of population. Tyre in particular had its most important part built upon a small island, which afforded it wonderful opportunities for defense, as such conquerors as Nebuchadrezzar and Alexander found to their cost.

But this island as explored by modern investigators has seemed to be so limited in size as to prohibit any thought that its population was ever large. And it at once becomes clear how necessary it was that colonies should be sent out from time to time, since the population of any prosperous country is constantly increasing. It has even been suggested that the main population of Tyre must, at any given period of its prosperity, have been necessarily absent from its island home on voyages of war or peace, since the restricted area of the island itself makes it difficult to account otherwise for the distribution of such a number of men as was necessary to equip the Phenician navies and trading fleets.

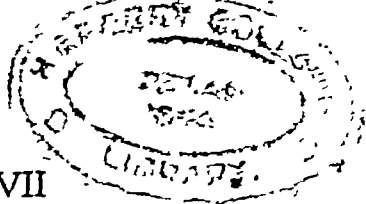
A nation of traders must necessarily have a high degree of intelligence of a practical kind, but it would seem that the culture of the Phenicians did not greatly advance beyond this. Their religion was always apparently of a very crude Oriental type, akin to that of the Babylonians and of the early Hebrews. In literature they apparently never ranked with these neighboring nations. Indeed, if they produced at any time a literature of significance, all traces of it are now lost, except certain fragments of doubtful authenticity that have come to us through the Greeks; the most important of these being the alleged writings of Sanchoniathon, as translated into Greek by Philo Byblius, and preserved, in part, by Eusebius



THE TRIUMPH OF LEONIDAS



ELEPHANTS OF WAR, ANCIENT AND MODERN



ROMAN WARFARE

IN the matter of an extensive and comprehensive military system, few nations, ancient or modern, have even equaled the Romans. The military organizations of Philip of Macedon and Alexander the Great, while complete and far-reaching, were ephemeral; and even in the acme of their existence will scarcely bear favorable comparison with the enduring organization of Rome. Fortresses and military roads still in existence in various parts of Europe, including Great Britain, give tangible evidence of what the fighting men of the Eternal City accomplished.

In the matter of fighting paraphernalia, hand weapons, and the heavier war engines, Rome had no advantage over her predecessors; nor could she boast of any great advance in military tactics over the Greeks. An individual Roman army was probably no better a fighting machine than a corresponding army of Macedonians. But it was the great military system as a whole—the uniform completeness of Roman military organization in Great Britain, Spain, or along the Rhine, as well as in the immediate precincts about the capital—that made it possible for her to conquer and hold her extensive territories for so great a length of time.

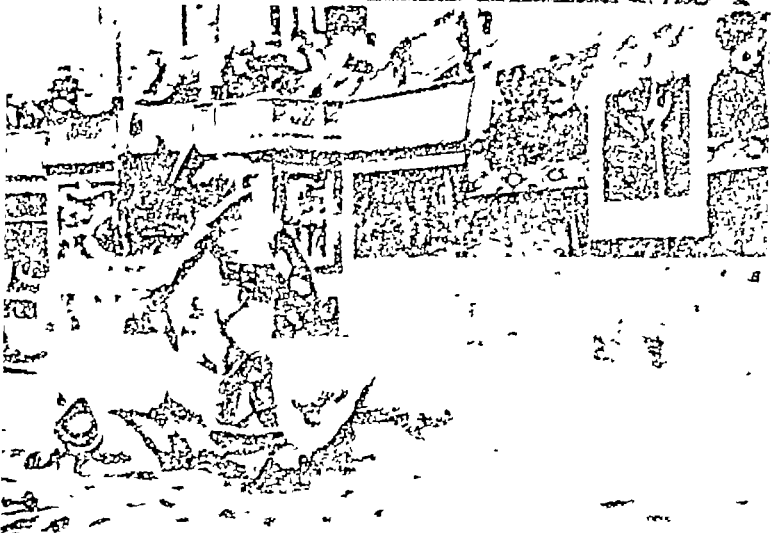
It should not be understood that this wonderful organization remained unaltered throughout the long period of Roman domination. It was, of course, changed from time to time to meet new conditions. New methods

of attack and defense and new weapons and armor were adopted constantly as contact with other fighting nations indicated defects and suggested improvements. Part of the secret of Rome's greatness lay in this readiness to adopt new and better methods wherever they were found. This flexibility of mind allowed her to discard useless methods as readily as she adopted new and better ones.

A spirit of impartiality pervaded her entire military system, at least until later times, everything else being sacrificed to actual merit. An example of this impartiality was shown in the Roman method of selecting the soldiers for the legions, as described by Polybius. The ordinary military organization of Rome was composed of four legions, each containing about four thousand three hundred men, the legions being divided into four classes of men—Velites, Hastati, Principes, and Triarii. The choosing of recruits from the levies was done in the following manner:

Four men, all of the same age and stature, were drawn from the levies and called before four Tribunes, each Tribune representing respectively one of the four legions. The Tribune of the first legion then chose one of the four levies; the Tribune of the second legion chose one of the remaining three; the other chose one of the two remaining men; the last man going to the legion of the fourth Tribune. Four more levies were then drawn, and from these the second Tribune first chose; the third Tribune second; and so on in regular rotation until all the levies had been drawn and assigned to the respective legions. In this way, as will be seen, all the Tribunes had equal chances in selecting men of corresponding age, size, and physique.

After selecting his troops for the legion, the Tribune



next determined the class to which each man should be assigned. The youngest and perhaps the less robust soldiers were set apart as light-armed troops. These were armed with short Roman swords, light javelins, and shields. The shield was circular in form and about three feet in diameter. The javelins were short, the wooden part being about three-quarters of an inch in diameter, and having an iron point eight or ten inches long. The peculiarity of this iron point was that it was made so slender that when it struck the ground, or the shield or helmet of an enemy, it bent and was rendered useless, thus obviating the danger of furnishing the enemy with a weapon. On the other hand it was of sufficient strength to pierce the body of an enemy unprotected by armor.

The Velites wore no armor, but were usually furnished with some distinguishing headdress, such as the skin of some animal. This served the double purpose of protecting the head and at the same time affording the commanders a means of distinguishing at a glance the class of soldier, or particular division, to which these men belonged.

The Hastati, the next in age above the Velites, were supposed to represent more seasoned and usually stronger men physically. They were armed with sword, shield, and two javelins, and wore helmets of brass and boots to protect the legs. Their shields were oval, about four feet high by two and a half broad, and were made of two planks glued together and covered with tough hide. The upper and lower rims were guarded with iron, and an iron plate protected the surface over the center.

The swords of the Hastati were of the ordinary Roman type, pointed and double-edged for thrusting or striking. Their two spears, however, were of different



types, a heavy one, the pilum, and a light one, not unlike the javelins of the Velites. The heavy spear was fitted with an iron head that ran well down to the middle of the wooden shaft, and was firmly riveted to it with a number of iron rivets.

This arrangement served not only to hold the head firmly in place, but, as in the case of the spear of the Franks later, turned a sword stroke which would otherwise sever the wood.

The most striking thing about the costume of the Hastati was their plumed helmets. To the top of each helmet were attached three feathers, something like a yard long, colored bright red or black. This tall head-piece, as Polybius says, "made the troops seem to be of double size, and gave them an appearance both beautiful and terrible." The Hastati also wore mail coats, with round pieces of metal or "heart-guards" over the breast. The arms and equipment of the Principes and Triarii were practically the same as that of the Hastati, except that the Triarii carried only the heavy spear and no javelins.

A peculiar custom of the Roman army was that of having two captains for every company. These captains were of equal rank, one commanding the right and the other the left of the company. If either captain were absent, killed, or wounded, the other assumed command of the whole company. In this way the danger of a company being without a commander at any time was lessened by half.

The equipment of the cavalry was the same as the Greeks; in fact it was the Roman's contact with the Greek cavalry that led to the adoption of their superior equipment. In earlier times the cavalry, which numbered only two hundred for every legion of four thousand foot

soldiers, was armed with light javelins and shields, and wore no armor of any kind. Such cavalry had proved practically worthless. But after observing the efficiency of the Grecian cavalry, the Romans improved their own along similar lines and increased their numbers from two hundred to three hundred for each legion.

They also adopted the heavy Greek cavalry shield and the heavy double-ended spear. Their own light javelins had been practically useless except for casting. The Greek spear was heavy and strong enough for thrusting, and had the advantage that, if the head was bent or broken, it could still be used as a weapon by reversing it, making use of the pointed iron butt.

The common type of Roman helmet differed from that of the Greeks in not having visor or other face protection; but various types were worn at different periods, the fashion changing from time to time either to meet new conditions or from caprice. One peculiar characteristic of many of the Roman helmets was a leaf-shaped piece of metal fastened to the skullpiece at either side, and coming down so as to give protection to the sides of the face and the ears. The closed visor, with wide rim and lengthened back that afforded protection to the neck and shoulders, was the helmet of the gladiator, not the soldier.

The early Roman cuirass, like the Greeks', was made of iron wrought so as to conform to the muscles of the breast and back, and in some cases richly ornamented. But the later Roman cuirass, the *lorica*, which seems to have been introduced by Camillus, and was perhaps the most characteristic part of the Roman soldier's equipment, has been made familiar by the figures on Trajan's column. It was made of five to seven strips of iron or bronze running horizontally around the body from the

armpits to the waist, each strip being about two inches wide. These were fastened to leather straps and were hooked together. Similar metal straps formed a covering for the shoulders, being hooked to the body pieces before and behind. Several strips suspended from the lower part in front gave protection to the lower part of the body. This cuirass, while comparatively light and flexible, afforded great protection.

Chain-armor and scale-armor cuirasses, were also used, but not as universally as the *lorica*; and there were also combination chain and scale mail-shirts, the plates of metal being attached to the chain beneath. Leather jerkins, reaching a little lower than the thighs, were frequently worn beneath the metal cuirasses for additional protection.

Greaves of bronze were generally worn, sometimes on the right leg only, as the other was protected by the large shield. In later times these metal greaves were replaced by leather or cloth ones, extending above the knees in front. Indeed, all the equipment of the soldier—his armor, shield, and weapons—underwent so many changes at various times that, first and last, almost every type was tried, altho as offensive weapons the Romans clung to the comparatively short spear and short double-edged sword in preference to longer weapons. The older sword was a one-edged weapon, but after the battle of Cannæ the superiority of the double-edged Spanish sword was recognized, and this style of weapon adopted. Being short and easily drawn, it was worn at the right side instead of the left.

The bow, which came into use in the time of Marius, was used only by the allies of the Roman army, or at most by some of the auxiliaries. The Asiatics, for example, frequently furnished the horse-bowmen of the

army, the bows used being short and double-curved like those of the Greeks; and while some of the horse archers were renowned for their skill, it is probable that the bow never played a very important part in Roman battles.

Slingers gained importance after the Carthaginian wars, and corps of them were attached to the army. Besides using stones as missiles, they also used pieces of lead varying in size, frequently moulded in the form of acorns, and bearing inscriptions of a defiant character like the Greeks'.

The cohort became the typical battle formation of the Roman army just as the phalanx was the typical formation of the Macedonian army. Before the time of the cohort, the Romans fought in what is known as the maniple formation. In this formation the legions were arranged in three lines of soldiers each ten ranks deep, these lines being broken up into groups of soldiers with intervals between the groups. The second line was so placed that its group of soldiers was directly back of the interval in the front line, and the third line was similarly placed so as to cover the intervals of the second line.

The advantage of this formation was its flexibility; it also afforded a possibility of maintaining a protracted attack or defense, the second and third lines replacing the exhausted soldiers of the lines in front by closing in through the gaps. But it had the disadvantage that a nimble enemy, with a sudden rush, might break through the intervals and destroy it.

To obviate this, the great military genius, Marius, introduced a new formation which became famous as the cohort.

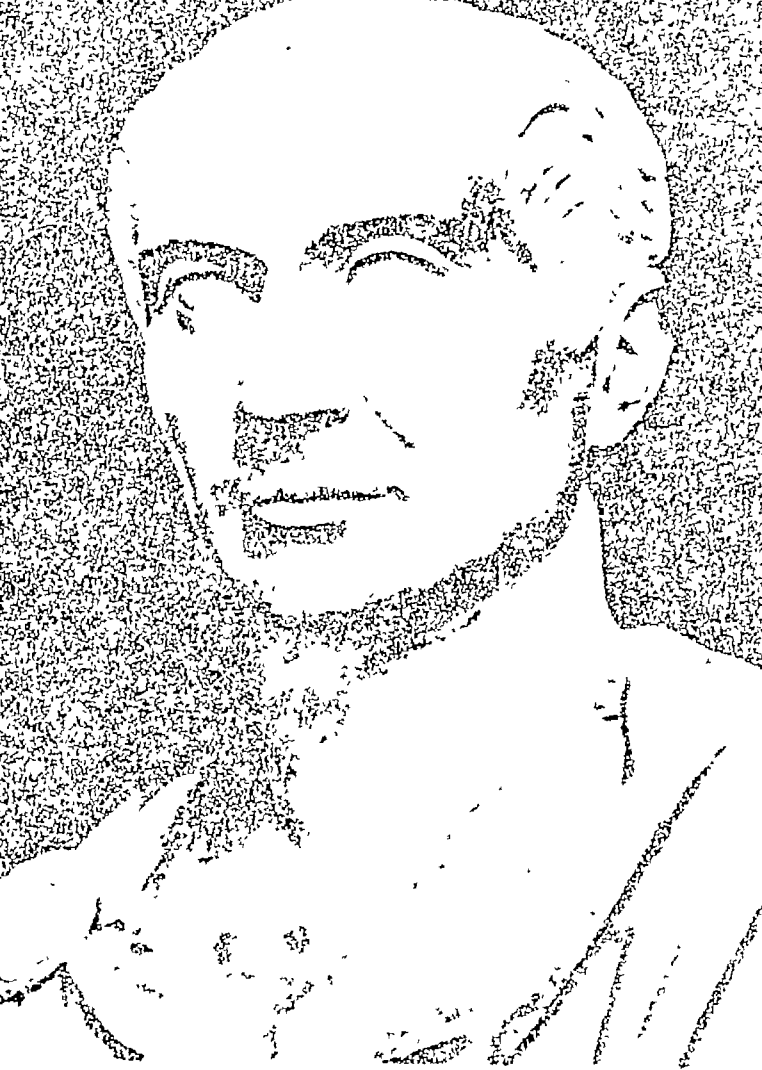
This was simply a modification of the maniple formation, still retaining the three lines, but with these lines

divided into more extended bodies of men, with fewer and smaller intervening gaps. In this formation each line became a practically continuous mass, and the first line was no longer able to retreat quickly between the intervals of the second as in the manipular formation. On the other hand, the second line could replace the first by stepping forward and inserting itself between the intervals in the files in front. In this way the front of the legion could be doubled in number without increasing the length. This was made possible by keeping a space of six feet around each soldier.

The difficulty of such a formation was in keeping the required space about each man. This was absolutely essential, for if the soldiers became packed together and the intervals were thus closed in the first lines, the second line became practically useless in relieving the first when exhausted, there being no space left for the fresh men to replace the exhausted ones in front without confusion and possible demoralization under vigorous attack.

Similarly the formation became ineffective if the space about each soldier became too great, as the ranks of the cohort might then be pierced by the enemy, the thin lines being unable to repel him. It was in keeping this formation that the discipline and drill of the Roman army was so necessary, and, as it proved, so effective.

With the change that came in the arrangements of the cohort formation came also a change in the weapons of the soldier. In the older formation the various ranks depended largely upon their short spears, or pilums, with little dependence upon missile weapons. Later, however, javelins came into favor, the soldiers carrying several of these besides the pilum, or using the pilum itself as a javelin. This pilum was the characteristic weapon of







VIII

GLIMPSES OF THE EARLY ROMAN EMPIRE

IN an earlier chapter we noted the changes in fighting galleys made by the Romans—how the heavier ships were replaced by light galleys, which had many advantages over the larger boats. These advantages were shown in the famous battle of Actium, where the light fighting boats of Agrippa and Octavius defeated the heavier boats of Antony and Cleopatra, on the second day of September in the year 21 B.C. This battle was the last important sea fight before the Christian Era. It determined the fate of Antony and Cleopatra and gave unrestricted power to Octavius—later to be known in history as Augustus—whose time of supremacy is usually assumed to have inaugurated a new era of world history, the period of the so-called Roman Empire.

From that hour there was no one to challenge the power of the nephew of Julius Cæsar.

A most extraordinary man was this foremost citizen of the new Roman state. But nothing about him is more extraordinary than the view regarding him that has been entertained by posterity. He has been almost uniformly regarded as not a man of the very first capacity—as an opportunist rather than a creative leader. He held the world under the sway of his will for almost half a century, and was never so autocratic in his power, so securely fixed in his position, as at the hour of his death. He found Rome brick and left it marble; he found the Roman state an inchoate, wavering commonwealth, and

left it a peerless empire. Yet the world has denied him the title of "great;" is disposed to deny him even the possession of genius.

Perhaps a partial explanation lies in the fact that we demand always a certain theatrical quality in a man of genius. It has been suggested by an eminent historian that a great man has usually a capacity for inordinate wickedness, as well as for consummate greatness. Alexander loses control of himself on occasion, and in his frenzy kills his friend. Hannibal spends his whole life under the spell of a sworn hatred. Cæsar stops at nothing to attain his selfish ends. In modern times your Frederick, your Napoleon, is not called great because of any moral quality. Public taste seems to demand a rounder character in its favored heroes: it likes the piquant flavor of immorality. In every direction your hero must be measured by other standards than ordinary mortals.

But the life of Augustus is keyed to the tone of a passionless moderation. He is all judgment, no emotion. Between the courses at dinner he listlessly plays games that he may not be annoyed by the persiflage of the jesters who are there to amuse his guests. And he plays the game of life in the same fashion. One cannot imagine him excited, enthusiastic, angry even. He might, indeed, commit a crime, but it would be a carefully measured crime, dictated by policy: not a crime of passion. Even in his liaisons, it was said of him that his chief ambition was to learn the real sentiment of those about him through their wives, rather than merely to gratify a personal appetite.

But it must not be forgotten that Augustus, had he not been such a man as this, could not have accomplished the work he did. Had he been full of enthusiasms



AUGUSTUS CÆSAR

he would have antagonized too many people; would have made too many powerful enemies; would have invited the fate that befel the man of genius whose nephew he was, and by whose good example he profited.

Yet, after all, the measure of capacity is success, and it seems a grudging estimate which withholds the title of "great" from the man who changed the entire complexion of the civilized world and put his stamp indelibly upon the centuries.

But whether genius or not in the ordinary acceptance of that loosely applied and somewhat ambiguous word, there is one regard in which Augustus need fear comparison with no leader of any age: in practical statecraft, judged by its result, he has no superior.

In a preeminent degree he was able to isolate himself from his environment; to visualize the political situation; to see his fellow men through the clear medium of expediency, undistorted by any aberration of passion or of prejudice. To the theatrical quality of personal vanity, from which Cæsar was by no means free, Augustus was an entire stranger. Because he was master of his own ambition, he came to be master of the world. If because of his placid logicity, posterity has been disposed to speak slightly of his genius, the same quality won him at least an unchallenged position as the most consummate master of practical politics.

But after Augustus came the deluge. The ensuing period was a time of stress and disaster. Of the eleven emperors whose lives compassed a period of a century and a quarter, eight met with violent deaths.

Under these conditions there must have been a feeling of uncertainty, of the instability of human affairs and human life, permeating the very air. It was preeminently a time when might made right, and, except for the rela-

tively brief periods when the good emperors Vespasian and Titus were in power, there was scarcely a time when any day might not logically enough be expected to bring forth a revolution. It required but a dagger thrust or the administration of a poisoned morsel of food to close a reign or a dynasty. And whether Nemesis came a few years earlier or a few years later was largely a matter of chance, and in most cases a matter of no great moment; since the new ruler was almost certain to be as bad as the last.

Why was such a state of things tolerated? Having put down such a man as Tiberius, why did the Romans submit, even for a moment, to the rule of a Caligula? When such a character as Claudius had been removed from the scene, why should the stage be reset for a Nero?

The answer is not hard to find. It is inherent in the anomalous political condition of the empire and the still more anomalous position of its ruler. The real fact is that the empire was no empire at all in the modern sense; from which it follows that the emperors had no such nominal position as the name of the title which we give them conveys to modern ears.

True, our modern word "emperor" is the lineal descendant of the word "imperator"; just as "kaiser" and "czar" are the lineal descendants of the word "Cæsar." But modern usage has greatly modified the significance of these words; and in dealing with the history of the early Roman Empire it must constantly be borne in mind that Cæsar was originally only the family name of the great dictator and the first five imperators, having at first no greater significance than any other patronymic; and that the word "imperator" meant and originally implied nothing more than general or commander-in-chief of the army.

It is related that Augustus—shrewd, practical politician that he was—ardently deprecated the use of any word implying “lord” or “master” in connection with his name. He was the emperor of the army, the princeps or leader of the senate, and the high pontiff (*pontifex maximus*) of church and state.

The practical powers which were either previously associated with these offices or were gradually clustered about them by the genius of Augustus, gave that astute leader all the power in fact that any modern emperor possesses. But while exercising such truly imperial functions, Augustus remained in theory an ordinary citizen, all his offices subject to the mandate of the people. He lived unostentatiously; conducted himself with the utmost deference toward his fellow citizens; kept his actions for the most part strictly within the letter of the law—albeit himself promulgating the laws; and went through, even for the fifth time, the form of being appointed to his high office for a period of ten years.

He gained a hold on the affections of the people, as well as a dominating influence over their affairs. They rejoiced to do him honor, conferring on him not only the titles and dignities already mentioned, but the specific title of Augustus in addition. Yet it must not be for a moment forgotten that no one of these titles conveyed to the mind of the Roman people the impression that would have been conveyed by the word “king.” Had Augustus even in his very heyday of power dared to assume that title, it may well be doubted whether he would not have met the fate of his illustrious uncle.

And if this was true of Augustus, it was equally true of his successors in the first century. To be sure, they succeeded to power much as one king succeeds another. Augustus chose Tiberius as his successor, and Tiberius



FUNERAL OF A POPEA EMPRESS
THE OSTROGOTHS IN THE FLOOD



assumed the reins of power quite unopposed. But it must be noted that in several cases, as in that of Tiberius and again when Nero succeeded Claudius, the artful machinations employed to keep secret the death of the emperor until his chosen successor could take steps to fortify himself with army and senate, implied in themselves the somewhat doubtful character of the title to succession.

In point of fact, there was no legal title to succession whatever. Until the form of a choice by the senate had been gone through with, the new emperor had no official status. There was no question of the divine right of succession. Indeed, how little the majesty that doth hedge a king availed to sanctify the persons of the early emperors, is sufficiently evidenced in the record of their tragic endings. Regicide is not unknown, to be sure, even in the most stable monarchies; but where eight rulers out of eleven successive ones meet violent deaths, it is evident that the alleged royal power has hardly the semblance of sanctity.

Meanwhile, the nominal form of government of the Roman people remained the same as under the commonwealth. Ostensibly, the senate was still supreme. Consuls were elected year by year, as before; and how widely the imperial office differed from its modern counterpart is well evidenced by the fact that the emperor was from time to time chosen consul, sharing the dignity then with a fellow citizen, who, theoretically, was his official equal.

If such was the nominal position of the emperor, what then was the real secret of his actual power?

It rested, not on the tradition of kingship, but on the simple basis of military leadership. "Imperator," as has been said, implied "commander of the legions"; and he

who controlled the legions, controlled the Roman Empire. That was the whole secret. There is nothing occult or mysterious in it all. Rome's position as mistress of the world depended solely upon her army; therefore, the man who controlled that army was master of the world. Hence it followed that when the army chose an emperor, be it a youthful Otho or a senescent Galba, the senate had no option but to ratify that choice with its approving ballot.

If, as happened after Nero's death, the army chanced not to be a unit in its choice, different legions bringing forward each a candidate, the senate must indeed make a decision, as, for example, between Vitellius and Vespasian; but it was the arbitrament of arms that ratified the selection. That the senate preferred Vespasian to Vitellius would have signified little in the final result, had not the army of the Flavians proved the stronger.

In a word, then, this Roman Empire of the first century, whatever its nominal status, is a veritable military despotism: it is not merely the emperor who is dependent upon the legions; the very nation itself is no less dependent.

The bounds of the empire extend from the Euphrates to the westernmost promontory of Spain, and from Egypt to Britain. About this territory, embracing the major part of the civilized world, is drawn an impregnable cordon of soldiers. Twenty-five legions make up this *chevaux-de-frise* of steel in the day of Tiberius. Eight legions are stationed along the Rhine; three legions in Pannonia and two in Moesia along the Danube; four legions are marshaled in Syria, two in Egypt, and one along the Mediterranean coast of Africa. Of the remaining five, two are in Dalmatia and three in Spain. Almost 400,000 men make up these legions.





Under the successors of Augustus, Britain is invaded, and made, like all the other frontiers, a camping ground for armies. A glance at the map will show how this great barrier of soldiers circles the mighty empire. Remove that barrier and the empire of Rome would shrink in a day from its world-wide boundaries to the little peninsula of Italy, perhaps even to the narrow confines of the city of Rome itself.

And why should it not be removed? What boots it to the citizen of Rome that his name should be a word of terror to the uttermost nations of the known world? What matters it more than in name that Spain and Gaul and Pannonia and Syria and Egypt acknowledge the sway of the city on the Tiber? The reply is that it matters everything; for these outlying provinces supply the life-blood of the empire. From these wide dominions all roads, as the saying has it, lead to Rome; and every road is worn deep with the weight of tribute.

The legions distributed all about the wide frontier were not placed there primarily to fight, but to exact tribute as the price of peace. Fight they did, to be sure; in one region or another they were always fighting. But this warfare was kept up primarily by the enemies of the state; Rome herself would seldom have taken the aggressive, had the people along her frontier chosen to submit to her exactions. She demanded only money or its equivalent; granted that, she was the friend and protector of all peoples within her domain.

And sooner or later most of these peoples found that it was better to pay tribute peacefully than to fight and be plundered. Here and there an obstinate people like the Jews held out for a time, but the almost uniform result was that ultimately the might of the legions prevailed; and then there followed indiscriminate pillage

of everything worth taking, to glorify the inevitable triumph of the Roman leader. The description of the treasures that delighted the eyes of the people of Rome when Titus and Vespasian triumphed after the destruction of Jerusalem, is but a sample of what occurred again and again in evidence of the prowess of Roman arms.

In the end, then, the provinces came to submit to the inevitable, however sullenly, and they poured their wealth into the hands of Rome's censors to be passed on to the emperor, who deposited such portion as he chose into the official coffers of the city.

In the time of Augustus it is estimated that the yearly tribute from the provinces was between seventy-five and one hundred million dollars. This was tribute proper, the literal price of peace. Nor was this all. Rome was the center of trade for all these provinces—the world emporium where the merchant of Spain might barter with the merchant of Syria, and where the produce of Gaul and Pannonia might be exchanged for the produce of Egypt. All articles from whatever quarter were subject to import duty; and all transactions of the market had to pay a percentage for excise.

When all this is borne in mind it will appear how the emperor—at once the commander of the legions and the keeper of the public purse—was able to dictate the laws, controlling not merely the property but the lives of his fellow citizens; for the power of gold was no less—perhaps no greater—in antiquity than in our own day.

We have seen what practical use the emperor made of this trenchant weapon. The records show how the masses were pauperized, some hundreds of thousands of Roman citizens receiving bread without price. The

largesses of Augustus are only comprehensible when one has fully grasped the position of the emperor as mulctor of nations. So long as all the productive nations of the world poured their earnings without equivalent into the imperial treasury, so long the citizen of Rome might live in idle luxury, taking no thought for a morrow, the needs of which were sure to be supplied by a paternal government.

Not merely sustenance but amusement is supplied. Augustus sacrifices five thousand beasts in a single series of games; a band of elephants competes with an army of gladiators. Even a naval combat is arranged on an artificial lake near the city. And in the later day this phase of practical politics is developed to even larger proportions.

Vespasian and Titus construct an amphitheater—the famous Colosseum—which seats eighty-five thousand spectators; and on a single occasion Titus rejoices the people with a series of combats lasting through a hundred days.

It is good to live in Imperial Rome—place of inexhaustible bounty, of unceasing entertainment. There is no need to work, for slaves by tens of thousands conduct all menial affairs. Indeed, there is no business for the free man but pleasure—the bath, the banquet, the theater, and the gladiatorial games. Rome is a glorious city in this day. With her renovated Forum, her new Capitol, her triumphal arches, her stupendous Colosseum, she is a city of marvels. To her contemporary citizens it seems that she is on a pinnacle of power and glory from which time itself cannot shake her. Looking back from the standpoint of later knowledge it is easy to moralize, to realize that all this mock civilization rested about the crater of a volcano. But we may well

believe that very few contemporary citizens had the prevision to match our modern thought.

And, indeed, it must in fairness be admitted that the shield has another side. However unstable the form of government, there is something in material prosperity which, up to a certain state, makes for intellectual eminence as well. And so in this first century of the Roman Empire there was no dearth of great men.

The golden age of literature was the time of Augustus; the silver age was the time of his immediate successors. The poets and philosophers have left us such names as Valerius Maximus, Asinius Pollio, Seneca, Lucan, Valerius Flaccus, Martial, Quintilian, and Statius. History and science were never more fully represented than in the day of Paterculus, Mela, Quintus Curtius, Florus, Pliny, Josephus, Suetonius, and Tacitus. A time which produced such men as these was not wholly bad. But no later century of Roman history was able to show such another list



ENSLAVED PRISONERS PASSING UNDER THE YOKE



IX

ROME UNDER THE LATER EMPERORS

THE time of the Roman Empire was by no means exclusively a period of decline. There were long periods of imperial history when the glory of Rome, as measured by its seeming material prosperity, by the splendor of its conquests and the wide range of its domination, was at its height. But two prominent factors have served to befog the view in considering this period.

In the first place, the fact that the form of government is held to have changed from the republican to the monarchical system with the accession of Augustus, has led to a prejudice for or against the age on the part of a good many writers. In the second place, the invasion of Christianity during the decline of the empire has introduced a feature even more prejudicial to candid discussion.

Yet, broadly considered, neither of these elements should have had much weight for the historian. In the modern sense of the word the Roman commonwealth was never a democracy. From first to last, a chief share of its population consisted of slaves and of the residents of subject states. There was, indeed, a semblance of representative government; but this, it must be remembered, was continued under the empire. Indeed, it cannot be too often pointed out that the accession to power of Augustus and his immediate successors did not nominally imply a marked change of government. The "emperor" was not a royal ruler in the modern sense of

the word. The very fact that the right of hereditary succession was never recognized—such succession being accomplished rather by subterfuge than as a legal usage—in itself shows a sharp line of demarcation between the alleged royal houses of the Roman Empire and the rulers of actual monarchies.

In a word, the Roman Empire occupied an altogether anomalous position, and the power which the emperor gradually usurped, through which he came finally to have all the influence of a royal despot, was attained by such gradual and subtle advances that contemporary observers scarcely realized the transition through which they were passing. The senate still held its nominal power, and year by year, for centuries to come, consuls were elected as the nominal government leaders.

Nevertheless, it is commonly held that posterity has made no mistake in fixing upon the date of the accession of Augustus as a turning-point in the history of the Roman commonwealth. However fully the old forms may have been maintained, the people in effect now submitted to a permanent dictator. The office of dictator, as such, had indeed been abolished on the motion of Mark Antony; but the Cæsars managed, under cover of old names and with the ostensible observance of old laws, to usurp dictatorial power.

There was an actual, even if not a nominal change of government. This change of government, however, did not coincide with any sudden decline in Roman power. On the contrary, as just intimated, the Roman influence under the early Cæsars reached out to its widest bounds and attained its maximum importance. Certainly the epochs which by common consent are known as the golden and the silver ages of Roman literature—the time, that is to say, of Augustus and his immediate

successors — cannot well be thought of as periods of great national degeneration. And again the time of the five good emperors has by common consent of the historians been looked on as among the happiest periods of Roman history.

Let it be repeated that the first two centuries of Roman imperial history are by no means to be considered as constituting an epoch of steady decline. That a decline set in after the death of Marcus Aurelius, some causes of which were operative much earlier, is, however, equally little in question.

Looking over the whole sweep of later Roman history, it seems difficult to avoid the conclusion that the empire was doomed almost from the day of its inception, notwithstanding its early period of power. But when one attempts to point out the elements that were operative as causes of this seemingly predestined overthrow, one enters at once upon dangerous and debatable ground. At the very outset, as already intimated, the prejudices of the historian are enlisted pro or con by the question of the influence of Christianity as a factor in accelerating or retarding the decay of Rome's greatness.

Critics have never tired of hurling diatribes at Gibbon because his studies led him to the conclusion that Christianity was a detrimental force in its bearing on the decline of the Roman Empire. Yet many more recent authorities have been led to the same conclusion, and it is difficult to say why this estimate need cause umbrage to anyone, whatever his religious prejudices.

The Roman commonwealth was a body politic which, following the course of all human institutions, must sooner or later have been overthrown. In the broader view it does not seem greatly to matter whether or not

Christianity contributed to this result. That the Christians were an inharmonious element in the state can hardly be in question. As such, they cannot well be supposed to have contributed to communal progress. But there were obvious sources of disruption which seem so much more important that one may well be excused for doubting whether the influence of the early Christians in this connection was more than infinitesimal for good or evil.

Without attempting a comprehensive view of the subject, it is sufficient to point out such pervading influences as the prevalence of slavery, the growing wealth of the few and the almost universal pauperism of the many fostered by the paternal government, and the decrease of population among the best classes, as abnormal elements in a body politic, the influence of which sooner or later must make themselves felt disastrously.

Perhaps as important as any of these internal elements of dissolution was that ever-present and ever-developing external menace, the growing power of the barbarian nations.

The position of any nation in the historical scale always depends largely upon the relative position of its neighbor states. Rome early subjugated the other Italian states, and then in turn, Sicily, Carthage, and Greece. She held a dominating influence over the nations of the Orient; or, at least, if they held their ground on their own territory, she made it impossible for them to think of invading Europe.

Meantime, at the north and west there were no civilized nations to enter into competition with her, much less to dispute her supremacy. For some centuries the peoples of northern Europe could be regarded by Rome only as more or less productive barbarians, interesting

solely in proportion as they were sufficiently productive to be worth robbing.

But as time went on these northern peoples learned rapidly through contact with the civilization of Rome. They were, in fact, people who were far removed from barbarism in the modern acceptance of the term. It is possible that they were of common stock with the Romans; and if their residence in a relatively inhospitable region had retarded their progress toward advanced civilization, it had not taken from them the racial potentialities of rapid development under more favorable influences; while at the same time the very harshness of their environment had developed in them a vigor of constitution, a tenacity of purpose, and a fearless audacity of mind that were to make them presently most dangerous rivals.

It was during the later days of the commonwealth and the earlier days of the empire that these rugged northern peoples were receiving their lessons in Roman civilization—that is to say, in the art of war, with its attendant sequels of pillage and plundering. Those were hard lessons which the legions of the Cæsars gave to the peoples of the north, but their recipients proved apt pupils. Even in the time of Augustus a German host in the Teutoberg Forest retaliated upon the hosts of Varus in a manner that must have brought Rome to a startling realization of hitherto unsuspected possibilities of disaster.

The one hope for the regeneration of Rome under these conditions lay in the possibility of incorporating the various ethnic elements of its wide territories into one harmonious whole. In other words, could Rome in the early day have seen the desirability—as here and there a far-sighted statesman did perhaps see—of grant-

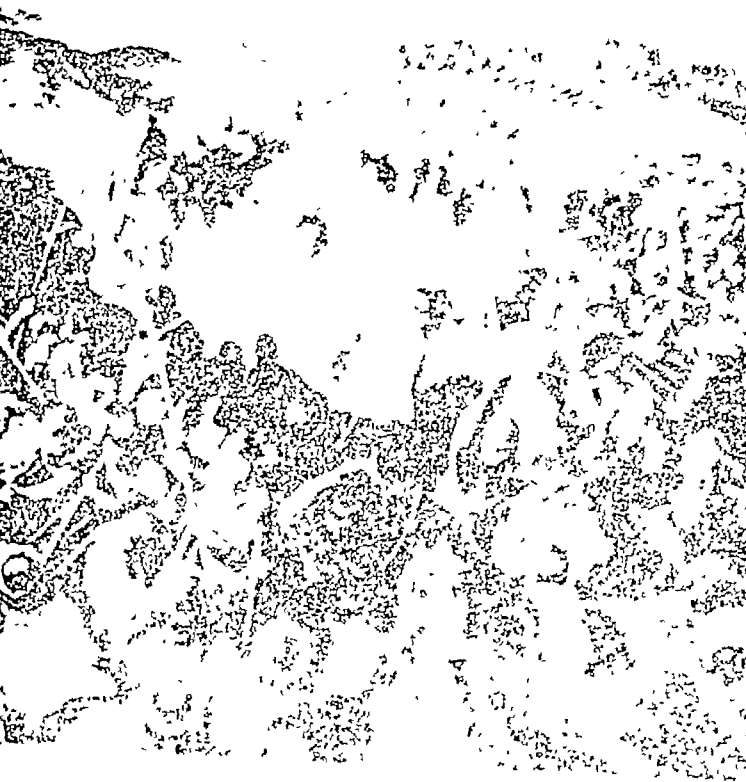


ing Roman citizenship to the large-bodied and fertile-minded races of the north, removing thus a prominent barrier to racial intermingling, the result might have been something quite different. It is the mixed races that build the great civilizations and crowd forward on the road of human progress

The Roman of the early day had the blood of many races in his veins, but twenty-five or thirty generations of rather close inbreeding had produced a race which eminently needed new blood from without. Yet the whole theory of Roman citizenship set its face against the introduction of this revivifying element. The new blood made itself felt presently, to be sure, and the armies came to be recruited from the provinces. After a time it came to pass that the leaders—the emperors even—were no longer Romans in the old sense of the word. They came from Spain, from Illyricum, and from Asia Minor. Finally the tide of influence swept so strongly in the direction of Illyricum that the seat of Roman influence was transferred to the East, and the Roman Empire entered a new phase of existence. The regeneration was effected, in a measure, by the civilization of an offspring state rather than the regeneration of the old commonwealth itself.

Then in the West the northern barbarians, grown stronger and stronger, came down at last in successive hordes and made themselves masters of Italy, including Rome itself. With their coming and their final conquests the history of old Rome as a world empire terminates

Reference has been made to the importance of the monumental inscriptions. For the imperial history these assumed proportions not at all matched by the earlier periods. It was customary for the emperors to issue edicts that were widely copied throughout the provinces,



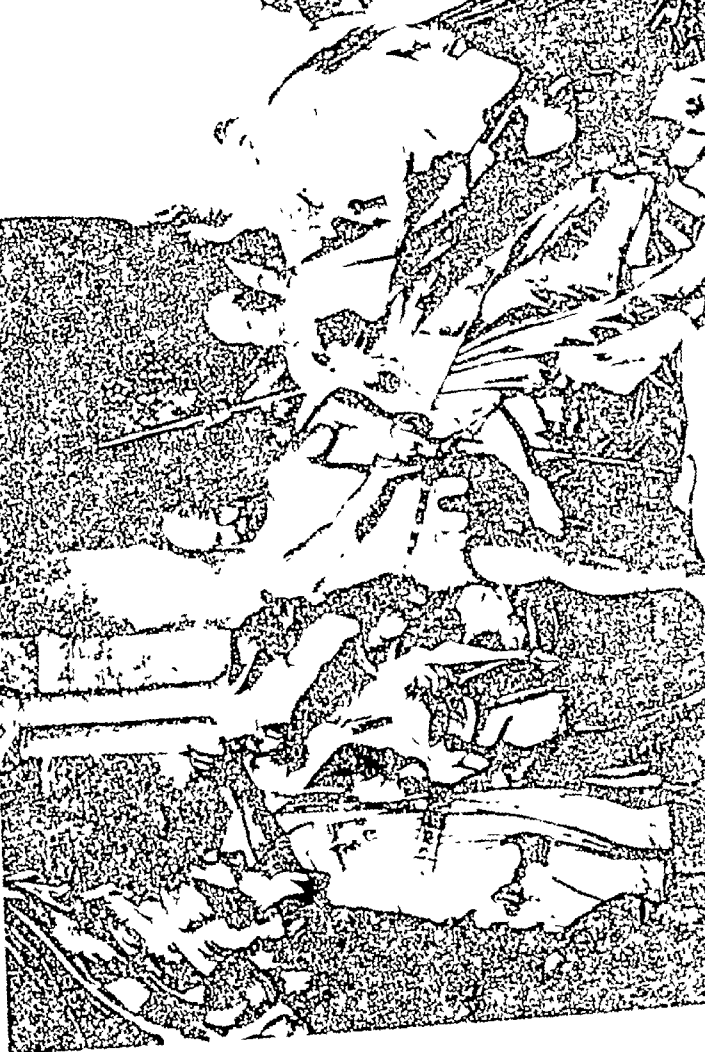
and owing to the relative recency of these inscriptions a great number of them have been preserved

As a rule these inscriptions have only incidental importance in the way of fixing dates or establishing details as to the economic history. On the other hand, such a tablet as the *Monumentum Ancyranum* gives important information as to the life of Augustus, and such pictorial presentations as occur on the columns of Trajan and Marcus Aurelius are of the utmost importance in reproducing the life-history of the period. For mere matters of chronology—having also wider implications on occasion—the large series of coins and medals is of inestimable importance. Without these various inscriptions many details of imperial history now perfectly established must have remained insoluble.

Nevertheless, after giving full credit to the inscriptions as sources of history, the fact remains that for the most of the important incidents that go to make up the story, and for practically all the picturesque details of political history, the manuscripts are still our chief sources. The authors whose works have come down to us are relatively few, and may be briefly listed.

For the earliest imperial period we have the master historian Tacitus, the biographer Suetonius, the courtier Velleius Paterculus, and the statesman Dion Cassius. As auxiliary sources the writings of Martial, Valerius Maximus, Pliny, and the *Jewish Wars* of Josephus are to be mentioned. For the middle period of imperial history Dion Cassius and Herodian, supplemented by Aurelius Victor and the other epitomators, and by the so-called Augustan histories or biographies, are our chief sources. After they fail us, Xosimus and Ammianus Marcellinus have the field practically to themselves, gaps in their work being supplied, as before, by the outline histories





X

WARFARE OF THE EARLY MIDDLE AGES

TO many persons the period of the Middle Ages—the time included between the fall of the Roman Empire, 476 A.D. to the discovery of America—is the most interesting in the history of the development of scientific warfare. Partly this is because it includes that fascinating period, the Age of Chivalry, with its perennial glamor of steel-clad courteous fighting men, and the equally fascinating period of the Crusades when armies of exalted and enthusiastic knights sallied forth to suppress the menacing Orientals and regain the Sepulcher.

In this time also the knight errant swarmed the land fighting for fighting's sake; gaudy minstrels twanged harps in woodland glades for masquerading kings or outlawed yeomen; great castles perched on picturesque crags, within which, as seen through the haze of history and legend, beautiful women and gallant men spent lives in one continuous round of mirth and feasting.

This was also the period of fantastic costumes, when men rivaled the male birds in gorgeous attire; when armor developed from simple quilted mail shirt to full steel garment and enormous metal head casque; and finally to the coming of firearms, when a ragged footman, armed with a little tube of iron with a fuse of burning cotton at the base, was more than a match for the knight, sitting, a tower of shining metal, on his great steel-clad war-horse.

To those interested in the development of scientific

warfare, this period is interesting because it includes a complete evolutionary cycle — an evolution from the crudest weapons of Gaul and Frank, without break in chronology, step by step through the improvements that culminated in modern scientific fighting methods, so much more terrible and effective than any ever conceived by the ancients.

These first tentative steps, with subsequent development up to a certain stage, had been taken centuries before by Egyptian, Assyrian, Greek, and Roman; and had Western Europe begun its development where Rome left off, the continuous history would extend many centuries further back. But Western Europe did not do this. Her semi-barbaric tribes, altho familiar with the advanced military methods of Rome, learned at a terrible cost to themselves, did not adopt them once the Romans had departed, but returned to their original primitive and peculiar methods. So the beginning of the Dark Age saw the future ruling nations of the world lapse into semi-barbarism, from which they emerged only by slow stages of evolution.

Thus we see them struggling and learning by experience, inventing and creating to meet new conditions, solving problems new to them, altho already solved by predecessors centuries before.

In two respects, at least, the early Franks resembled the American Indians: they threw tomahawks and scalped their victims. Their tomahawk, or *francisca*, was their favorite weapon, and was used most effectively when rushing upon an enemy. It was thrown when within a few yards of the enemy's line, and while the Frankish soldier was running at full speed; and was closely followed by a furious attack with the barbed spear, sword, or dagger.

Besides this *francisca*, the arms of the Franks were sword, shield, dagger, and a barbed spear or javelin. They did not wear helmets or armor of any kind, their protection at most being leather jackets and a kind of long leggings, or pantaloons. Neither did they use slings or bows, depending for missiles upon their tomahawks and barbed javelins.

This javelin was quite as characteristic a weapon as the *francisca*. It was comparatively short, with an iron head running well down the stave. The head was barbed, so that even a slight wound from it was most annoying and painful, as the head could only be withdrawn with great difficulty. In a similar manner it stuck firmly in an enemy's shield when once it had pierced it, and embarrassed his movements. In battle the Frank attempted thus to transfix the shield of an enemy, when by rushing forward and placing his foot upon the handle the Frank could force the shield downward, exposing his enemy's head to a blow of the *francisca*.

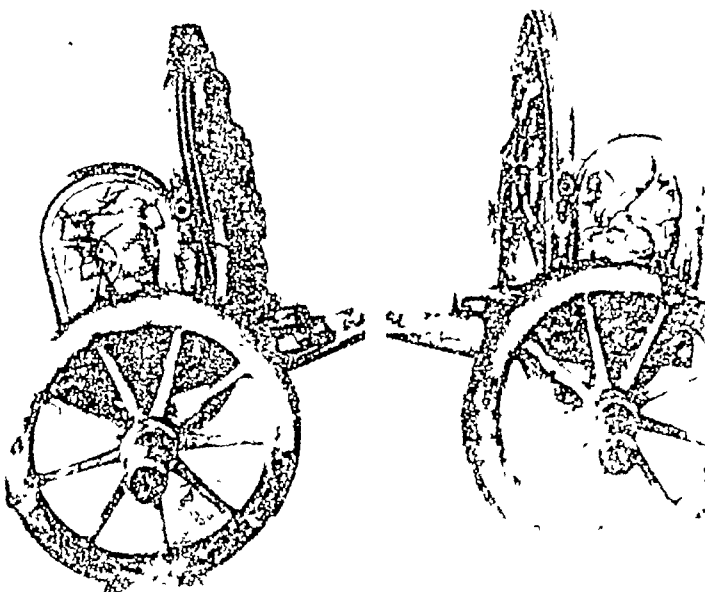
Until about 600 A.D., the Frankish offensive weapons remained practically unchanged, and their armies were "disorderly masses of infantry, fighting in dense column formation." Then a gradual introduction of protective headpieces and body armor began, and with these innovations came the use of horses.

By the end of the seventh century the wearing of armor and fighting on horseback had become common practises among the upper classes. But no regular army, or army organization, was introduced for several generations after this. Until the time of Charlemagne the Frankish soldier was supposed to bring with him on a campaign everything necessary for fighting and sustenance.

Hence these Merovingian armies were unable to carry

2. WONDER POWK - F. ADOLPHUS CARP

To protect themselves from the Japanese
imperial forces, I was so situated as to
explore the country through the mountains
and mountains. In 1905, I was
attempted the supply of the Japanese
force was an exhausted and I was
the soldiers deserted and the
For this reason the Japanese
the progress made during the
and the progress made during the
the progress made during the



POJAN, HAD I OF THE

XI

MILITARY ORGANIZATION OF CHARLEMAGNE

THE accession of Charlemagne in 786 A.D. marks the beginning of a new epoch in Frankish war methods. Previous to this time, as we have seen, the Franks had been gradually improving their weapons and their armor, had become familiar with the use of cavalry to a certain extent, and had thus prepared the way for a great leader like Charlemagne, to organize them into a nation of trained soldiers.

Hitherto they had fought as undisciplined peasant-soldiers—militia, called together when war threatened, to be disbanded and returned to their homes as soon as the danger was past. Charlemagne changed all this, and established what amounted to a standing army. He introduced a system of grouping, whereby one man out of every "group" was to hold himself in readiness for fighting, the others being obliged to furnish him with the necessary equipment. In this way the men who responded to a call to arms came as well equipped and fairly well trained soldiers, instead of poorly armed peasants.

Such an army was relatively small, of course, but its efficiency was much enhanced.

Besides this new system of maintaining a force of trained fighting men, Charlemagne also introduced a system of strict discipline, thus further increasing the effectiveness of his army. He encouraged the development of cavalry and the wearing of armor, and made

laws to prevent pieces of armor being sold or sent outside his empire. A tradesman detected in attempting to carry a piece of mail out of the country forfeited all his property. Persons holding property were obliged to equip a certain number of soldiers proportionate to the extent of their land; and every soldier was obliged to arm himself according to his financial standing.

In this way the wearing of helmets and mail-suits finally became a matter fixed by law and no longer at the discretion of the soldier.

Besides improving the equipment and the discipline of his army, Charlemagne also improved the commissary department, but not to the same extent as the other departments. The levies of soldiers were still obliged to furnish their own rations as formerly, but the choice of food and the amount taken on the campaign were fixed by a military ordinance. The rations consisted of wine, flour, and bacon, sufficient to last three months; and an ordinance provided that carts of a certain capacity were to be used in transporting the rations while on the march.

The laws controlling the military organization were not all issued at one time, but were scattered over a period of ten years—from 803 to 813 A.D.—and were the outgrowth of experience. The last of the new regulations dictated that the followers of a count, for example, must be provided with "shield, spear, a bow with two bow-strings, and twelve arrows." From this it will be seen that the bow had become part of the recognized equipment of the soldier in the ninth century; and the general progress is shown by the fact that even the poorest peasant must bring a bow and no longer simply a club, as in former times. But as yet the archer did not enjoy the popularity which he earned a century later.

Another innovation introduced by Charlemagne was

the establishment of fortified posts or camps. These were arranged in chains, connected by roads, and permanently garrisoned. Such camps were entrenched and palisaded, and became centers of population. Cities like Magdeburg, Paderborn, and Bremen, were so established. Under Charlemagne also something like a scientific disposition of bodies of troops was introduced, but the exact arrangement of his horse and foot soldiers in battle is not known.



ARMOR FOR MAN AND BEAST

epi alterius clericos ad
sua sollicitudine nec ordinem
f. i. e. d. e. m. et nullus epi. seruiat
alterius ecclesie extra officium
domini sui uoluntatem pro
uere presumat. Et hoc canoni
se concilium prohibet. epi.
f. e. a. d. ut si quis sacerdotum con
tra constitutionem decessit ad pre
sumptiose agere et corrigi nolens
ab officio suo moueatur. epi.
In decretis gelasii pape. ut nullus
epi. uideat uolare presumere
e. p. i.

Haec enim dilimi pio studio
et magna dilectionis intentione
una unanimiter amore studi

capituli et eorum iudicium
etiam et per se canonici
f. i. e. d. e. m. et nullus epi. seruiat
alterius ecclesie extra officium
domini sui uoluntatem pro
uere presumat. Et hoc canoni
se concilium prohibet. epi.
f. e. a. d. ut si quis sacerdotum con
tra constitutionem decessit ad pre
sumptiose agere et corrigi nolens
ab officio suo moueatur. epi.
In decretis gelasii pape. ut nullus
epi. uideat uolare presumere
e. p. i.

CAPITULARIA OF CHARLEMAGNE

(A. D. 805)





FORTUNES OF WAR

XII

CHANGES IN ARMS AND ARMOR

AN idea of the armor and equipment of the Frankish fighting man may be had from the writings of a contemporary scribe who told what the armor of the great Charlemagne was like:

"Then appeared the iron king, crowned with his iron helm, with sleeves of iron mail on his arms, his broad breast protected by an iron byrnie, an iron lance in his left hand, his right free to grasp his unconquered sword. His thighs were guarded with iron mail, tho other men were wont to leave them unprotected that they may spring the more lightly on their steeds. And his legs, like those of all his host, were protected by iron greaves. His shield was plain iron without device or color. And round him and before and behind him rode all his men, armed as nearly like him as they could fashion themselves."

It will be seen from this that armor had begun to take a prominent place in the equipment of the soldier at that time. Until the time of Charlemagne the protective armor of the soldiers of Western Europe was at most an open helmet and a short byrnie, or mail coat, reaching to the hips; but in the ninth century the gradual evolution into more complete protective armor began. About the first change was the introduction of the hauberk—at first simply a short curtain of leather fastened to the rim of the helmet, giving protection of the neck, sides of the face, and throat.

The next step was the adoption of chain armor in place of leather, this covering the chin as well as the neck, and descending to the shoulders. It was sometimes tucked in under the top of the mail shirt and sometimes worn over it. This chain-mail curtain was fastened to the edge of a leather skull-cap, and over this the metal helmet was placed. Later the helmet and hauberk became one piece like those of the modern Persians.

This was the helmet worn in the middle of the tenth century. From having the helmet and hauberk in one piece it was only one step to joining the neck piece to the mail shirt, making them into one garment, which was done in the twelfth century; and the name hauberk was applied to this garment, as the short-curtained helmet had disappeared.

The helmet itself meanwhile had been undergoing modifications, and the shape was entirely changed in the ninth century. The prevailing type of Frankish helmet up to this time had been an open crested or pointed affair, shaped something like an inverted soup plate, the rim standing well out from the face. This was now supplanted by a plain conical headpiece, without crest or point. To this was added, in the tenth century, the protective nose-piece, or nasal—a bar of metal extending from the rim of the helmet, between the eyes, to the end of the nose or somewhat below it, thus protecting the face from a down-stroke of sword or ax. This was the prevalent type of the twelfth century, when it was superseded by the more solid "pot-helm," which covered the face completely, leaving only the eyes exposed.

In the ninth century also changes began in the length and shape of the mail coat. Horsemen, in charging an enemy fighting on foot, suffered greatly from leg wounds, as these members were unprotected. This was particu-

larly the case when fighting the Vikings, with their devastating axes. To meet this danger, the mail shirt was lengthened to reach well below the knees. But in order to use this garment on horseback it was necessary to split it at the back and front, like a divided skirt. Later the leg flaps were fastened around the legs in a kind of loose pantaloon, thus insuring better protection than the loose flap, which, in the heat of the fight, was likely to fly out of place and expose the thigh.

The shape of the shield was also modified about this time. The foot soldiers still used the round or oval shield, but such a shield was clumsy to handle on horseback. If reduced to a smaller size it could be managed easily, but afforded insufficient protection. It was therefore supplanted by a kite-shaped buckler. This could be handled with little inconvenience while holding the bridle reins, and afforded the maximum protection for the minimum space occupied. The Monk of St. Gall speaks of Charlemagne's "iron shield," but the shield in common use was a heavy wooden affair covered with leather and studded with iron.

The changes that were made in offensive weapons between the eighth and twelfth centuries were slight in comparison to those made in defensive armor. The swords used, however, were generally somewhat longer, with rounded points, and were not used for thrusting. The two-handed ax was adopted from the Danes, and the shorter *francisca*, used as a missile weapon for so many generations, gradually went out of use. There are reasons for believing, however, that such weapons were still in use by the English late in the eleventh century; and by some chroniclers they are referred to as being "hurled at the oncoming Normans" by Harold's soldiers, at the battle of Hastings, 1066.







CRUSADERS SETTING FORTH







XIII

THE VIKINGS AND MAGYARS

LESSONS taught by the predatory Vikings played an important part in the development of the fighting methods of the nations of Western Europe. Before these nations could cope with the fierce northern foot-soldiers, who stolidly stood their ground and fought to the last man, they were obliged to change their arms, armor, and fighting methods. Meanwhile a very different but equally fierce type of warrior had appeared in Eastern Europe, menacing the Teutonic tribes quite as much as their Viking neighbors. The Magyars, a race of light horsemen, proved quite as irresistible, for a time, as the heavy northern footmen.

Different fighting methods were necessary to cope with these two classes of warriors; but the Teuton rose to the occasion and eventually drove one enemy into the sea, the other back into his territory along the Danube.

The first raid of the Danes into Frankish territory was in 799 A.D. They came armed with spears, swords, bows, and two-handed axes. These axes were single-bladed weapons, having handles five feet long, and when wielded with both hands they were terribly effective. The swords of the Vikings were short and leaf-shaped, not unlike those of the Greeks in the time of Alexander. The northerners were particularly skilful with the bow, and very proud of their skill.

They were trained warriors, fighting in compact

bodies, against whom ragged Frankish armies of equal numbers could not contend successfully. But as they came for plunder rather than conquest, they avoided fighting as much as possible unless driven to it by greed, or attacked by an opposing force. They fought on foot, using horses only as a means of rapid marching.

Their method of conducting their plundering expeditions was to land at some chosen place, haul their boats ashore, and surround them with a fortified camp, protected by a stockade, leaving a part of their number to guard it. The remainder scoured the neighboring country and collected horses, on which they hurried into the interior, plundering and burning as they went.

When attacked they would select some hilltop, if possible, dismount, and fight from behind their "shield-wall"—holding their shields in line and overlapping, thus making a complete protection against missiles.

If defeated by overwhelming numbers, they hurried back to their ships, launched them, and made off to some other unprotected coast for further plundering.

When driven to the wall they were desperate fighters, and even with their ranks broken and cut to pieces they would still rally and return to the combat. Of their stubborn courage, Oman says:

"Nothing shows better the stubbornness of the Danes than the way in which they often by a desperate rally regained a lost battle. It was hard to say that a Viking host was really disposed of till its last banner had been cut down and its last man slain."

As their successes increased, they became bolder, no longer depending upon their boats as bases, but establishing permanent fortresses, or posts, in the interior. These were entrenched and stockaded, the site selected usually being an island inaccessible to the inhabitants



of the country, who were not provided with boats of any considerable size.

It was evident that to cope with such an enemy the Franks must change their military methods. The swiftly moving horsemen could seldom be overtaken by the Frankish foot soldiers, and when overtaken were more than a match for them. The Vikings' double-handed axes, and their well-directed arrows, played havoc with soldiers protected only at most by open helmets and short mail shirts. The Franks, therefore, set about developing bodies of cavalry and improving their protective armor, and presently they were able to cope with the Northmen when fighting in the open.

But the northern rovers were still supreme on the water, harrying the countries about the rivers by shooting swiftly upstream in their boats, plundering an unprepared or poorly defended village, and rowing away again beyond the reach of the pursuing horsemen. To prevent this, Charles the Bald, about the year 866, conceived the idea of constructing fortified bridges—an innovation destined to play a very important part in later warfare. He first started the construction of one at Pitres, on the Seine, some miles from a Danish stronghold; but as this was an elaborate structure that took some years for completion, the Northmen continued to rush their boats through the unfinished gap. Moving a little further upstream, therefore, Charles quickly threw a less pretentious structure across the river, and fortified it. A party of Norse raiders returning from above shortly after its completion were unable to pass this new structure, and after desperate attempts to break through, made peace and were allowed to pass only after giving up their plunder and prisoners.

Encouraged by this, Charles constructed fortified

bridges across the Seine at Paris, similar to the structure at Pitres. These bridges were simple massive fortifications thrown across the stream, having towers and parapets for the protection of the soldiers, and supported on piles of rock thrown into the river. The ends of the bridges were supported by huge towers known as "bridge-heads." These bridges at Paris were kept fully garrisoned, and played a very important, and possibly a determining, part in defeating an eleven months' siege by the Northmen in 885 A.D.

We have seen how the arrows and two-handed axes of the Vikings compelled the Franks to adopt better armor protection for head and thigh; and how their swift incursions on the stolen Frankish horses made it necessary for the Franks to develop their cavalry. This heavily armed cavalry was soon called upon to settle the question of supremacy in Western Europe, pitted against the Magyars, the fierce race of horse-bowmen of Finno-Ugrian stock who had settled on the Danube in the ninth century.

The chief occupation of these Magyars was fighting and plundering. They never attempted sieges, but confined their tactics to operations in the open field. Like the American Indians, their method of attack was to swoop in successive detachments round and round an enemy, sending clouds of arrows into his ranks. When too hard pressed they ran away on their wiry little horses, only to swarm back to the attack again as soon as their pursuers gave up the chase.

In ambuscading and surprising an enemy they were unequalled in Europe, and there was no limit to the savage cruelties inflicted upon their prisoners. They scoured the country in small war parties, which, appearing suddenly out of the forests before some lonely dwelling,

would destroy it and kill the occupants, and be gone before the countryside could rally to make a stand against them. In a word, they were to civilized Europe what the Indian of a later day was to the American colonist.

For several years the Magyars had looked with envious eyes upon the wealthy territory of Germany, and had been restrained from depredations only by the payment of heavy tribute exacted from the Teutons. But when, in 924, they compelled Henry the Fowler to pay a large tribute and to conclude an ignominious treaty, that fighting monarch, recognizing the strength as well as the weakness of his subjects, took steps to rid the country of their troublesome neighbors.

The heavy German cavalry of that period had proved of little service against the swiftly moving Magyar, and Henry's first move was to lighten the equipment of some of his horsemen. He also established a chain of fortifications, compelling the people of the frontiers to build walled camps. Every ninth man was detailed as a soldier, who lived in a walled enclosure built by himself and the other eight men, a cottage for each being also erected within this stockade. This ninth man was obliged to remain on duty within the enclosure at all times and keep a lookout for Magyar raiders, while the other eight worked on their lands outside within safe distance of the walls in case the enemy were sighted.

Even the abbeys were compelled to wall themselves in, so that they might not be turned into strongholds by the invaders. Thus Henry established a line of permanent fortresses, many of which became centers of population and are now flourishing cities. By thus preparing for an attack Henry's soldiers were able for the first time completely to defeat the invaders—in 933.

But the Magyars, if defeated this time, were by no means conquered, and in 954-55 they mustered all their forces for a final attempt to overthrow the growing power of Western Europe. They realized that it was to be a contest that would decide the issue for all time, and every available warrior was brought with their army from the Danube. This great army marched swiftly into Germany, and laid siege to the city of Augsburg.

On hearing of this, Otto the Great, the son and successor of Henry the Fowler, collected his army of cavalry and hastened to attack the invaders. Hastily raising the siege of Augsburg, the Hungarians drew up their forces on the level plain on the banks of the Lech, a flat country admirably adapted to their methods of fighting. But, knowing their methods, Otto maneuvered his army so as to approach them through broken ground not adapted to their style of fighting, divided his army in three wings, and established a camp on the banks of the Lech. This maneuver left the Magyars no alternative but to attack the strong encampment.

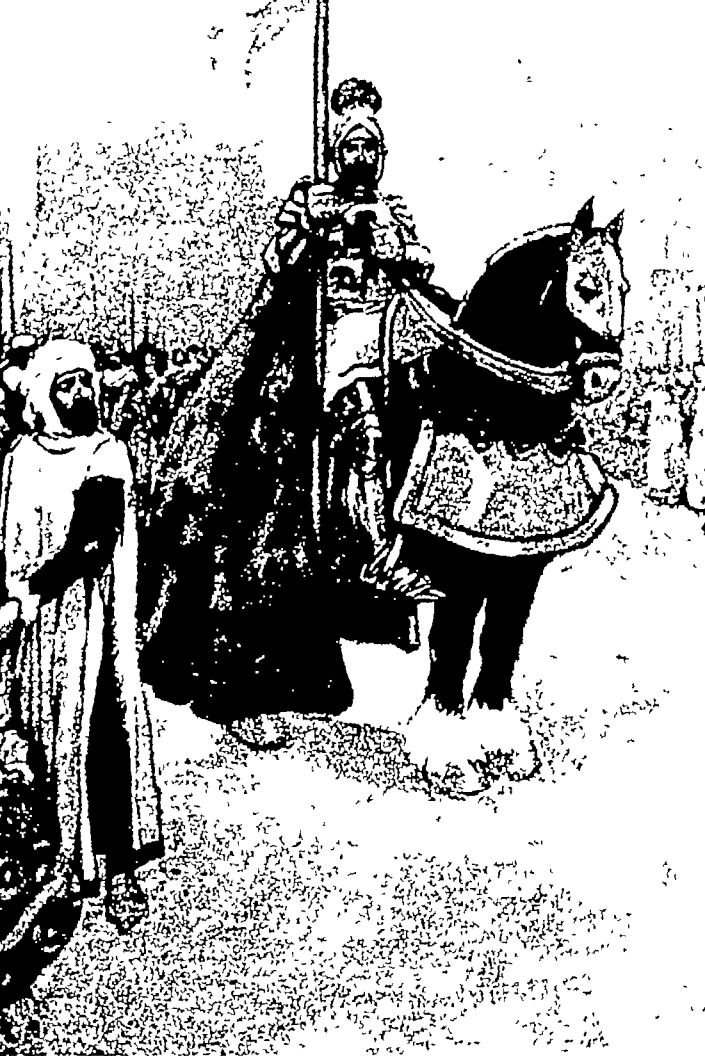
With the German army at that time was a certain Duke Conrad who had rebelled against Otto at one time and whose loyalty was still in doubt. To test the duke, and at the same time to give him a chance to redeem his reputation, Otto sent him against the wing of the Magyar army, which at the first onset had overwhelmed and driven in the Swabians forming the left wing. Rushing into the confused and struggling mass of defeated Swabians, Duke Conrad quickly turned the tide of battle and drove off the Magyars in confusion, whereupon Otto ordered a general charge along his entire front.

By this time the tough little horses of the Magyars were almost exhausted, while those of the Germans were

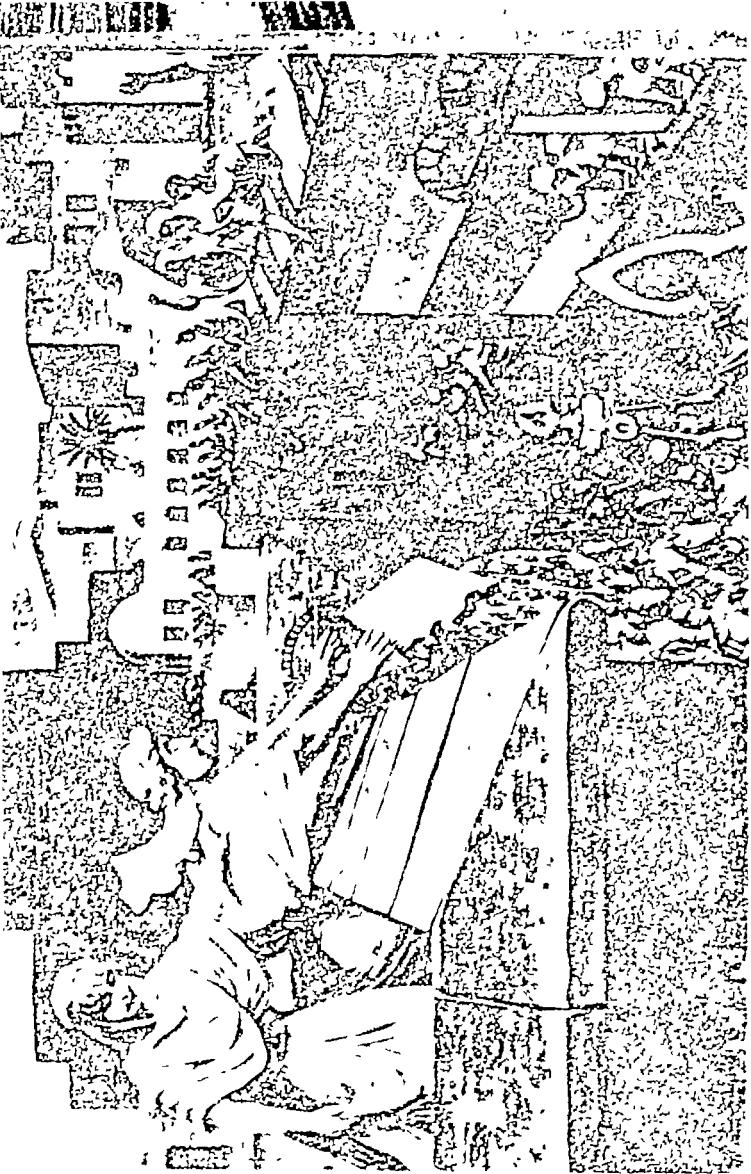
fresh. For once the unarmored Hungarians were obliged to stand in a man-to-man fight with the Northern warriors, and at this game they proved no match for the German soldiers. After contesting the ground for a time they turned and fled. But the victorious Teutons were hard upon their heels, riding them down and cutting them to pieces. Hundreds were driven into the river and drowned. Others who reached the opposite shore found the slippery bank too steep for their tired horses to climb, and were killed at the water's edge. Three of their great chiefs were captured and hung. The victory was complete, and Western Europe was again freed from the dangers of a barbarian conquest.

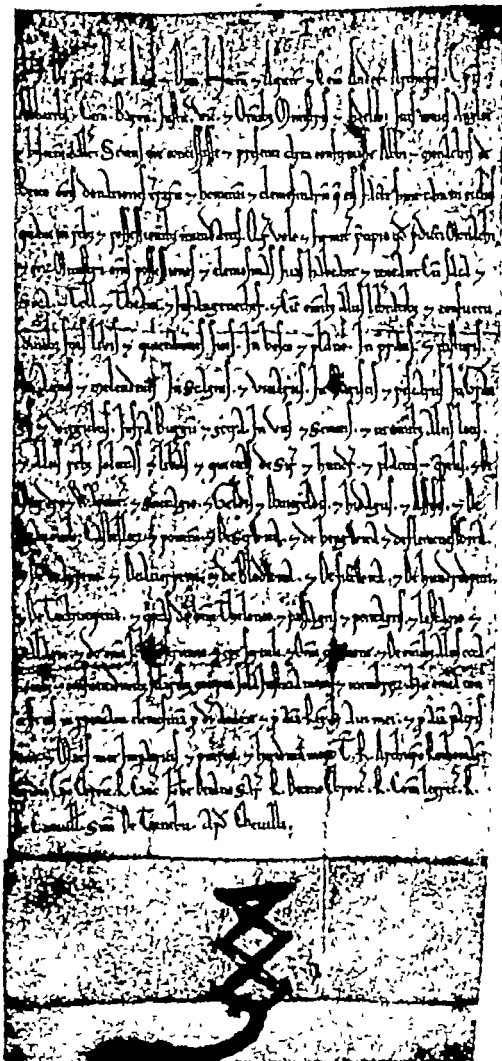


HENRY III MEETS DUKE DE GUISE



WHEN KNIGHTS WERE BOLD





CHARTER OF HENRY II (A.D. 1174)

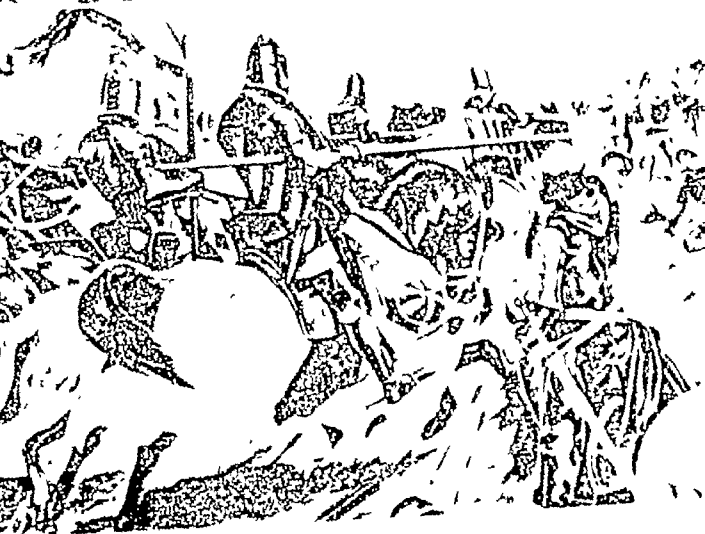
Philippus comes...
 REX. SEC. ET INDIUIC. CRIMIN. ADH. PH. VI. GRA. JANCOR. REX. H.
 e uniuersis presentibus pater et futuris. Qd. sciet di. et pater grua obsequia que sunt
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 et fructus benigne donauimus. et concessimus. ut de quib. libet literis. seu priuilegiis. seu ce
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XIV

NEW METHODS AND MODIFIED ARMOR

IT has been said that siegecraft, even in the later Middle Ages, had made little advancement over ancient methods. The attacking army still depended chiefly upon battering rams, bows, and mines for destroying the walls, just as the Assyrians did at least a thousand years before the Christian era. The medieval besieging engines were as a rule feeble affairs as compared with those used by Alexander the Great and the Romans.

One weapon had come into use, however, that played an important part in both sieges and field operations. This was the crossbow or arbalest—simply a hand catapult that could be worked by one man and without the aid of machinery.

A somewhat similar weapon had been known to the Romans; but it was not used extensively by them and seems to have been forgotten until about the end of the tenth century; at just what time it was reintroduced and by whom is unknown. It was in use at the time of the first Crusade, however, and has been described by Anna Comnena as follows:

"It is not a bow held in the left hand and bent by the right, but can only be spanned by the bearer stooping and placing both feet against it, while he strains at the cord with the full force of both arms. In the middle it has a semicircular groove of the length of a long arrow, which reaches down to the middle of its stock; the missiles, which are of many and various kinds, are

placed in the groove, and propelled through it by the released cord. They pierce wood and metal easily, and sometimes wholly imbed themselves in a wall or any such obstacle when they have struck it."

This weapon underwent many modifications during the centuries intervening between its invention and the discovery of gunpowder and its practical application to small arms. In England it was supplanted by the more effective weapon, the longbow, but on the Continent it remained a favorite weapon until the time of the musket.

Curiously enough, the wars of the Crusaders added little to the science, or, for that matter, the art of warfare. The first Crusaders, ignorant of the tactics of the enemy, took with them no fighting men that they counted of any consequence as soldiers, except heavily armed and armored horsemen. They had practically no wielders of missile weapons, neither bowmen, crossbowmen, nor slingers. When attacked by the Saracen horse-bowmen, lightly clad and superbly mounted, there was nothing for it but to stand and take their showers of arrows on their shields and armor. If they charged, the nimble Turks simply fled out of harm's way, only to return to the attack as soon as the pursuers turned their backs.

The second Crusade did somewhat better, and succeeding ones learned to use archers and crossbowmen, and to depend more upon the despised infantry than at first.

But the experiences of the Crusaders in the East seemed to have little effect upon the tactics in Western Europe. The infantry was not developed, and during the twelfth and thirteenth centuries the mailed horseman maintained his place as the chief factor in battle. The art of constructing and fortifying, however, made some

progress, and this was made more evident by the fact that methods of attacking fortresses had not improved correspondingly. The gap between advances in building fortifications and in methods of attacking them continued to widen until the middle of the fourteenth century, when the tables were gradually but irrevocably turned by the introduction of gunpowder.

As defensive fortifications had outstripped offensive besieging weapons and engines, so defensive body armor had advanced more rapidly than offensive weapons.

Body armor was made increasingly heavier and more effective against the weapons in general use. This was illustrated by the condition of the exhausted Frankish army captured near Tiberias in 1187. After the surrender it was found that their horsemen had been so well protected by their armor that very few had been even wounded, altho they had been under a steady shower of arrows for hours.

This development of body armor had been a gradual process of evolution. One of the first steps toward increasing the protection of the body had been to lengthen the sleeve of the mail shirt. In the time of William the Conqueror the sleeve of this mail shirt reached only to the elbow; but by the end of the eleventh century there had come into use a long sleeve, close-fitting, and fastened about the wrist.

At the beginning of the twelfth century the gambeson, or shirt of quilted cloth, became popular. The knights wore this garment under their mail shirts to deaden the effect of hand strokes and missiles, which, even if they did not penetrate the chain armor, produced severe bruises and broken bones beneath it.

The poorer classes of soldiers wore the gambeson without other armor, such a garment of itself being very

effective in resisting arrows or sword strokes. Just how effective some of these gambesons could be made was illustrated by the Spaniards in Mexico in the sixteenth century, who discarded their steel cuirasses for the Aztec gambesons, which they found "much lighter and equally effective."

By the end of the twelfth century great changes in body armor were in progress. About this time the pot-helm came into existence—a metal casque flattened at the top and completely covering the head and face, with the exception of eyeholes and sometimes breathing holes.

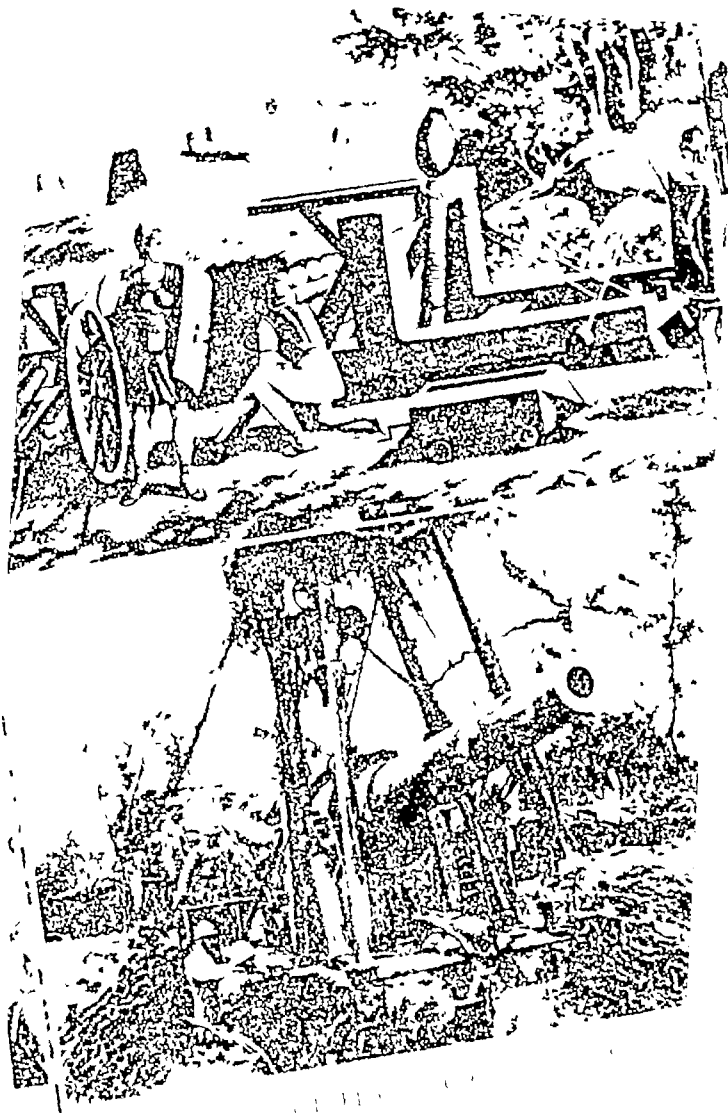
This pot-helm was the type of helmet worn by Richard the Lion-Hearted (1157-1199 A.D.). It was a clumsy affair, sometimes of such weight that it was lengthened so as to rest upon the shoulders to relieve the strain upon the neck. As it was not moulded to the shape of the head, it sometimes became turned in the fight so that the eyeholes were out of position, rendering its wearer helpless until some comrade came to his assistance and set it straight for him. When knocked from their horses and trampled under foot in a *mêlée*, the knights were sometimes smothered by these iron pots.

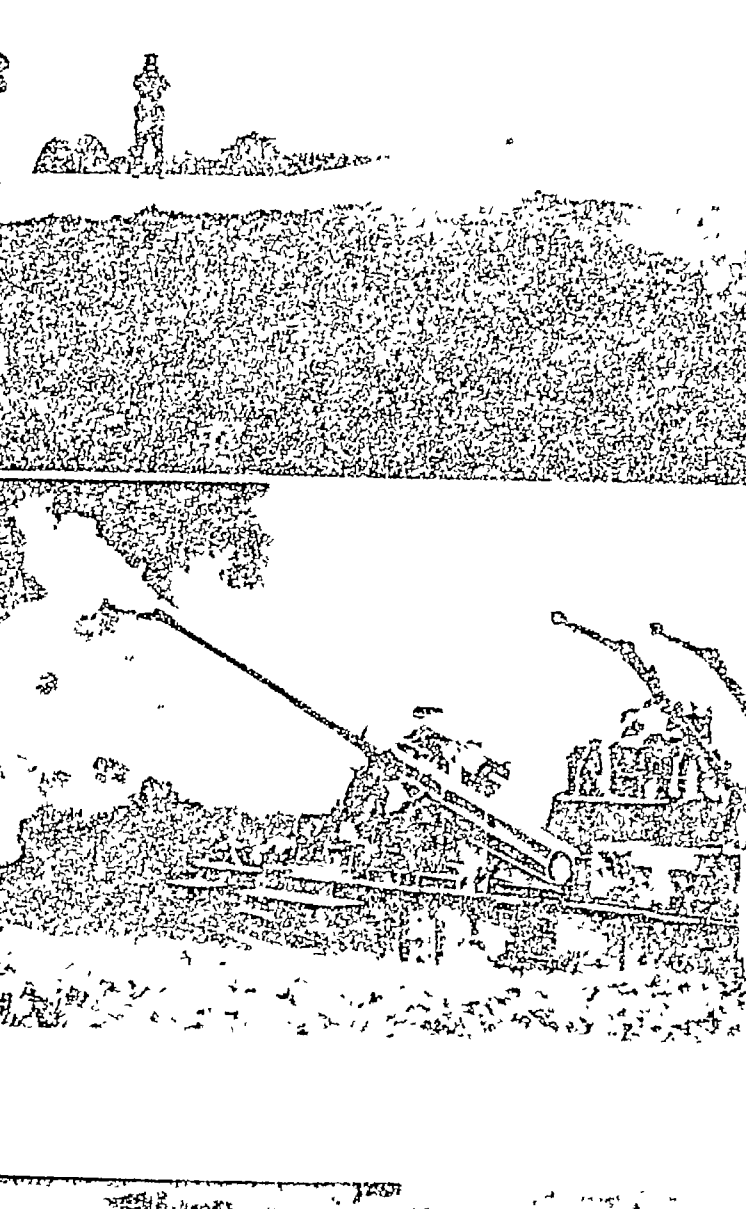
For these various reasons many knights refused to wear such helmets, trusting to the more comfortable mail hood or coif.

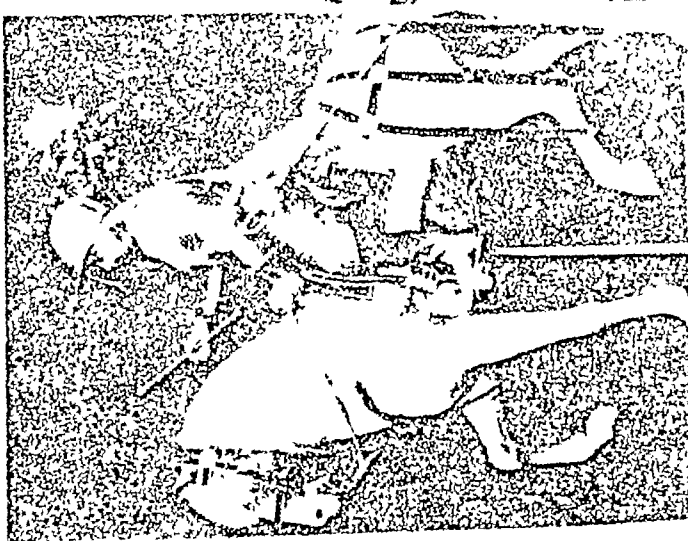
With the increased protection afforded by the body armor, the shield became less essential, and decreased in size gradually until by the beginning of the fourteenth century it was comparatively insignificant. It retained its kite shape, however, as most convenient for use on horseback.

At this period the leg-coverings of simple pieces of mail laced to the outside of the leg and thigh, were replaced by the chain-mail stocking, surrounding the









foot and leg and reaching to the waist. The covering of every part of the body was finally completed by the introduction of chain-mail mittens connected with the sleeve of the mail shirt; these being supplanted in turn by the glove with separate fingers, about the end of the thirteenth century.

To this flexible suit of mail, pieces of metal began to be added, first by steel caps at such exposed points as the knee or elbow, and metal plates over the shins and thighs, fastened to the chain-mail beneath. The breast-plate also was introduced, first worn under the mail shirt and later above it, but at this period it was simply a small shield protecting the chest, and did not protect the armpits.

Thus surrounded by metal at every point, the knight became practically invulnerable to the weapons used by the ordinary soldier, even when prone on the ground and helpless. Oman cites the case of Reginald of Boulogne, who was unhorsed at the battle of Bouvines (1214 A.D.) by French sergeants, who attempted to dispatch him as he lay on the ground but were unable to do so because of the complete protection of his armor. Such armor was proof against arrows and bolts from the bow and arbalest unless fired at close range, but could not, of course, turn the missiles thrown by the heavy catapults. Scott describes the archer Robin Hood as cursing the armor of knight De Bracy, because he could not wound him, altho he "tried every crevice" of his mail.

At this period, and for two succeeding centuries, the knight in his thick-walled castle could defy the besiegers while at home, and in his steel casing of body armor need have little fear of pike, club, or any other weapon but the longbow and arbalest while abroad. But meanwhile the death-knell to body armor was being sounded

by the crude cannon, whose slow but sure development was to make feudal castle and mailed knight no longer invulnerable.

To be sure the cloth-yard shaft of England's long-bowmen, and the bolts and quarrels of continental cross-bowmen, held the mailed horsemen somewhat in check for two centuries before the perfection of firearms. For even the heaviest armor must have joints and crevices, and the wonderfully skilful archers of the late Middle Ages and early Renaissance were able to find these openings and reach vital spots. But this was only in open battle. Such weapons necessarily played an unimportant part in sieges of castles and strongholds, and, as we have seen, the invention of engines for attacking such fortifications did not keep pace with the building of thick walls and the methods of defending them. Such engines were mostly relatively feeble imitations of Greek and Roman battering rams, and bores, catapults, ballistæ, and mangons.

There was, however, a powerful engine, called a trebuchet—one of the few new devices introduced in warfare during the Dark Age.

This weapon, like the mangon, was used for hurling heavy projectiles—the "heavy artillery" of siegecraft. Like the mangon, it consisted of a heavy beam, or arm, balanced on a pivot supported by uprights, the delivery of the projectile being effected by this swinging arm. The force necessary to accomplish this swing was given by a counterweight instead of depending upon torsion of twisted ropes or hides. The old-fashioned steel-yards illustrate exactly the principle of the trebuchet, the throwing arm being represented by the weighing bar, the counterweight by the object being weighed, and the sliding balance, the projectile.

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Fasten down the arm of a steel-yard, set to weigh ten pounds, let us say, with a cord, allowing the sliding weight to rest lightly on the end, place a hundred-pound weight in the weighing pan, and then suddenly release the cord, and the swinging "yard" will hurl the now wholly inadequate weight far into the air.

This illustrates exactly the principle upon which the trebuchet worked.

And as these engines were sometimes constructed of an entire tree-trunk for the swinging arm, with tons of earth or stone for counterpoise, we can picture a powerful and fairly accurate weapon for hurling masses of rock or iron, and barrels of combustibles into a besieged fortress.

There were various modifications in the methods of applying the counterpoise. Sometimes it was a swinging basket containing the desired weight of stone or iron; or again it might be a fixed weight, a sliding one, or both, the amount of force being determined by the position of the sliding counterpoise. A still further modification of this was to use pulling-ropes for the counterpoise, two or more men giving the impetus to the missile to be thrown by suddenly jerking upon these ropes. This last was, obviously, a comparatively feeble engine, but had the advantage of being easily moved from one vantage point to another.

The receptacle for containing the object to be hurled was subject to many modifications. The most simple form was a spoon-like cavity or basket at the end of the beam. But in place of this a long rope was sometimes added, acting like a sling on the principle of the whip-lash. That such an arrangement is effective in hurling light missiles is illustrated in a small way by the long swinging whip-lash of the old-time western cow-punch-

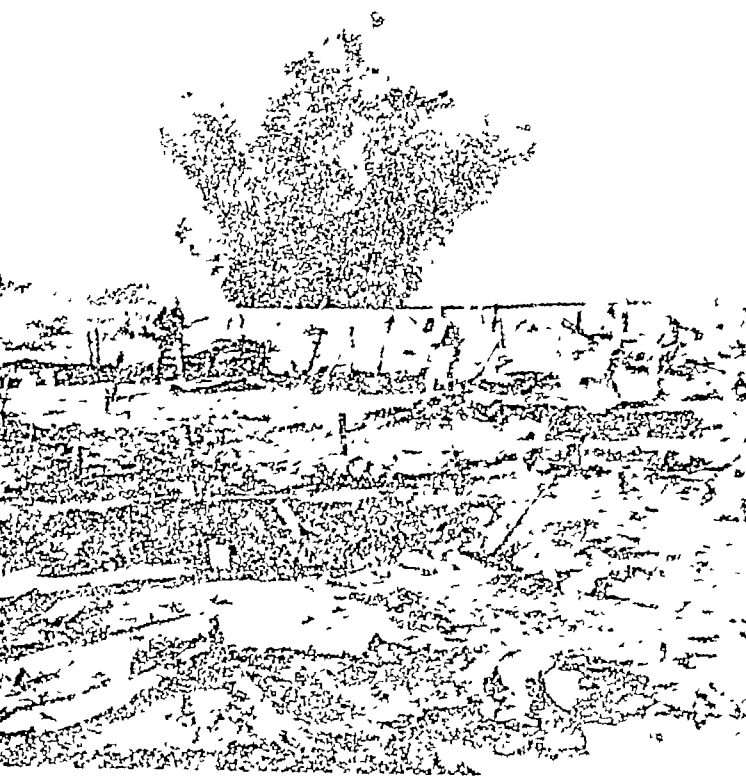
hand conflicts it could be thrown from "squirt-guns," and once the flames were started they could be fed by jars of the liquid thrown into the flames, which in bursting ignited everything on the vessel.

At the siege of Acre in 1190 the Saracens burnt all the besieging engines of the Crusaders by throwing pots of this Greek fire down upon them.

No thickness of armor could protect a knight from this terrible agent. A cupful of the liquid, striking upon any part of the armor of horse or man, meant almost certain death, either by burning or suffocation. For it ran and spread, belching out flames and smoke, unquenchable by ordinary means, licking into the crevices of chain-mail shirt or metal plate, which could not be removed in time to save the victim.

The Saracens used both trebuchets, or similar engines, and catapults for hurling vessels containing their Greek fire, and the effect of this upon the Crusaders was most demoralizing. The accuracy of the aim of the Moslem was increased by making their projectiles in the form of huge arrows, the head being formed of jars containing the fire. When these were shot from the engines they are described as roaring through the air, bursting and spluttering the terrible fire all about when they struck.

The effect of this fire upon the Christians is comparable to the effect of firearms for the first time against the savages of America; and the awe and fear inspired among the Crusaders was scarcely less than among the savages. One doughty knight, who courted danger in ordinary battle, confessed that when he heard the roar of the oncoming ball of Greek fire, he "cast himself upon the ground in abject fear, praying heaven to preserve him." It may be taken for granted, therefore, that no





XV

THE LONGBOW OF ENGLAND

AN important part in the development of English infantry was played by the longbow, which was preeminently a British weapon. Some of England's greatest victories were won chiefly by foot soldiers armed with the longbow.

The crossbow, or arbalest, had been a favorite weapon with certain English kings. Richard the Lion-Hearted is said to have been skilled in its use; and some succeeding rulers had also favored it. So the view held by some, that British soldiers did not adopt the arbalest because unfamiliar with it, cannot be entertained. The fact seems to be that, after trying both weapons, the English archer rejected the arbalest. The longbow became his distinguishing weapon, just as the *sarissa* was the distinguishing weapon of the Macedonian, the *pilum* the distinguishing weapon of the Roman, and the *francisca* the distinguishing weapon of the Frank.

Just where or when the longbow originated has never been definitely determined. The use of the ordinary bow is older than civilization itself, and all nations have at various times had bodies of good archers. But ordinary bowmen and ordinary archery were completely eclipsed by the perfection of the longbow.

In the principle of its construction the longbow was in no wise different from the bows used by nations of preceding centuries. It was simply a longer and stronger bow. But with this lengthening and strengthening of

the weapon came the development of increased skill in using it—skill that compared favorably with that of the soldier of a hundred years ago using the regulation musket.

This was made possible by the length of the weapon, which permitted the archer to pull his cloth-yard arrow back as far as his ear, greatly increasing the accuracy of discharge. The ordinary three- or four-foot bow shot a short but heavy arrow, which the bowman drew back to the chest, the discharge thus being practically at random. The longbow was ordinarily the height of the archer who used it.

Attempts have been made to show that the longbow was originated—or at least introduced—by the Norman conquerors of England; but there seems to be no good ground for this contention. If true, the Continent lost a most effective weapon and never again adopted it, for the "longbow of England" was a British weapon, and *British only, from the time of Edward I (922-946) when it came into full prominence, to the period of its decline during the reign of Elizabeth.*

In its relation to other arrow-throwing weapons, the longbow holds much the same place in perfected archery that the "Kentucky rifle" of Revolutionary times held to the army musket of that period. The English longbowman was effective and accurate at a distance out of bow-shot for ordinary short bows, or even for cross-bows.

According to Clepham, the longbowman could hit a standing figure with great certainty at two hundred and fifty yards. The famous Enfield rifle of the American Civil War in the sixties was sighted only up to five hundred yards; and Berdan's noted sharpshooters, who used a gun so heavy that it could not be supported at the

shoulder without a rest, considered a range of six hundred yards as the limit of effectiveness.

Knowing the remarkable possibilities of the longbow, Benjamin Franklin, in 1776, when it was very difficult for the Americans to obtain muskets, proposed the equipment of a regiment with longbows. His suggestion was treated as too fantastic for serious consideration, but if we may judge from records made even today by expert archers, the suggestion was perhaps not such a visionary one. Eighteen years after this suggestion a contest was held at Pacton Green, in Cumberland, in which the bowmen made sixteen hits out of twenty at one hundred yards; while the muskets only scored twelve hits.

The great rival of the longbow, particularly on the Continent, was the crossbow, or arbalest. But the advantage seems to have been almost entirely with the longbow, as it was superior to the crossbow in distance, penetration, and rapidity of discharge. It is thought by some modern students of the subject that the stunning effect of the heavy crossbow quarrel was greater at close range than the impact of the cloth-yard shaft; and this is probably true. But the significant fact remains that Englishmen clung to the longbow, and English archery stands without a rival.

In accuracy at point-blank range there was probably little difference among the best archers and the best crossbowmen. But the general average of shooting—the really important thing—was all in favor of the longbowmen. An ordinary longbow archer discharged from ten to twelve arrows per minute, as against the crossbowmen's three. Furthermore, his accuracy in quick shooting was much greater, because he could keep his eye fixed upon his mark, while the crossbowmen must

lower his weapon after each discharge and wind the windlass to pull back the bow-string, thus losing the range.

Nor was this all. The effective range of the crossbow was at most only two hundred yards, while that of the longbow was fifty yards farther, as we have seen. Besides these many disadvantages, the crossbow had the additional demerit of being heavy and cumbersome, susceptible to dampness, and from its clumsy shape, hard to protect in bad weather.

The battles of Crecy, Poitiers, Halidon, and Agincourt afford striking examples of what effective archery did for England. This was particularly well illustrated at Crecy, where the opening of the battle was between English longbowmen and French mercenary crossbowmen. Fully alive to the importance of effective archery in receiving an attack, the English posted their longbowmen in front to repel the charge of the French.

To offset this, the attacking army sent ahead a cloud of six thousand lightly-armored Genoese crossbowmen, closely followed and supported by a solid mass of mounted knights. The crossbowmen in good alinement advanced to the foot of the incline leading to the English position, stopped, and discharged their weapons. But so great was the range that practically every missile fell short.

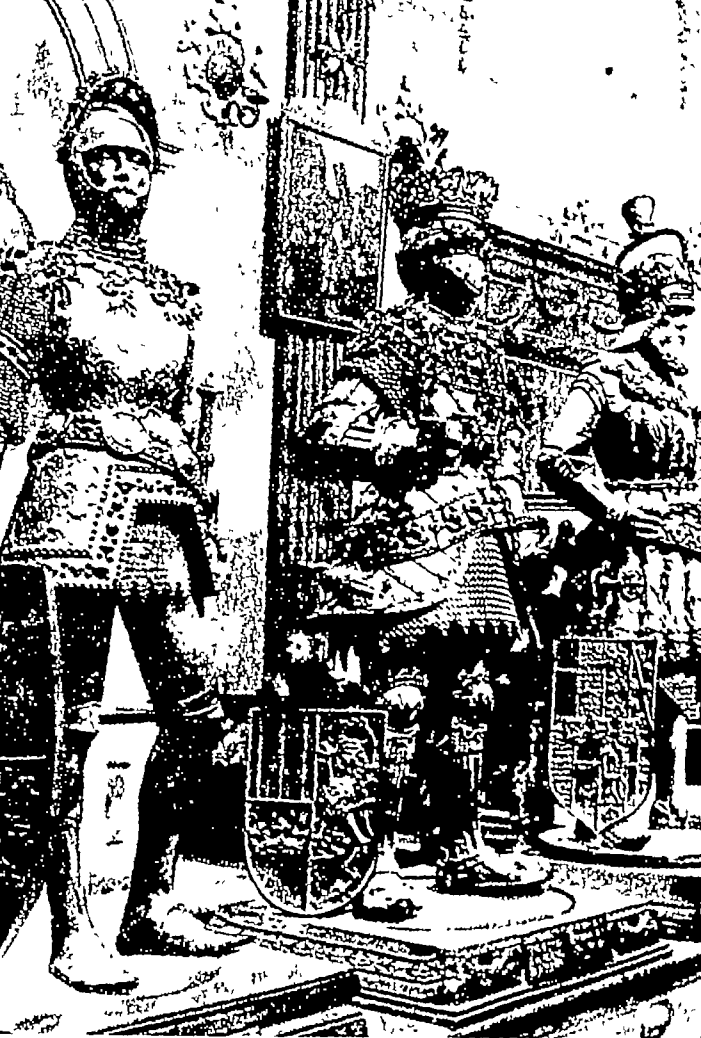
In reply the English archers poured in volleys of cloth-yard shafts that not only reached their enemies, but cut them down by hundreds, covering the ground with dead and wounded. The light armor of the crossbowmen was no protection against the "gray-goose shaft." But, for that matter, the armor of the knights who followed closely in another assault was little more so. Time after time in the waning twilight the pride

of French chivalry charged the ragged line of English peasants, only to be shot down by the archers or forced to fly to a point out of range of their arrows.

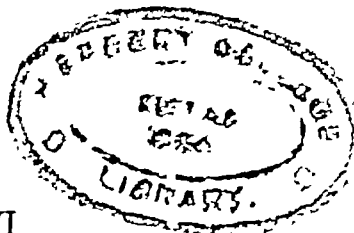
But neither Crecy, Poitiers, nor Agincourt could teach the Frenchman the value of the longbow. The arbalest was his weapon to the end.

The best longbows were made of yew, altho other woods, such as ash, were frequently used. The arrows were tipped with feathers, preferably those of the goose or peacock. At one time there was a law allowing sheriffs to collect a tax of six feathers for each goose in the kingdom. The longbowman usually carried, besides his bow and a quiver of arrows, two stakes, a lead hammer, and frequently a dagger. When forming to receive an attack, the stakes were driven into the ground before him, slanted at an angle to impede the horsemen or footmen. The hammer was used in driving these stakes, but served also as a weapon at close quarters.

On the introduction of gunpowder the gun gradually replaced the longbow; but it took centuries to complete the conquest. Even in the time of Henry VIII the longbow was popular, Henry himself being a skilful archer. While he lived, the laws enforcing the use and controlling the sale of longbows remained in effect; but after his death archery declined, until by the end of the reign of his daughter Elizabeth the longbow as a weapon had become obsolete.



AS THE STATUES IN THE GLOOM
WATCH O'ER MAXIMILIAN'S TOMB



XVI

TRANSITION FROM CHAIN TO PLATE ARMOR

AS we have seen, there was a gradual transition taking place in the twelfth and thirteenth centuries, from chain-mail suits to plate armor. The head was of course particularly vulnerable, even the thickest wadding and best chain hood, or steel cap, not preventing fractures of the skull from fairly delivered blows of ax or mace. For this reason iron helmets gradually came into use, as we have seen, long before plates of metal were used for fortifying certain parts of the body armor.

The transition period from the time of chain mail to armor made entirely of metal plates, was the fourteenth century. It should not be understood, however, that this change can be traced accurately chronologically. In fact, as J. Starkie Gardner points out, a good chronological arrangement of mail as it appeared has never been made. And it is probable that no such arrangement is possible, except in a very broad and general way, as there was a constant overlapping of types of armor, each knight wearing armor to suit his particular style of fighting, his whim or his prejudice.

Some knights, for example, absolutely refused to wear the pot-helm in battle, preferring the danger but comfort of the simple coif to the discomfort and added protection of the great heaume.

Or again such a knight as Sir John Chandos, the great fighting man of the Black Prince, would never



wear a visored helmet, always fighting with his face exposed, while practically every knight around him wore the protecting visor.

The same thing applies, of course, to various parts of the armor other than the helmet, so that individual examples of suits of armor may not fairly represent a given period. In a general way, however, it may be said that plate armor was not dominant, or perhaps even perfected, before the beginning of the fourteenth century; and that it had practically superseded chain armor by the middle of the fifteenth.

The period of transition, in England, was from about the reign of Edward I (1272-1307) to the reign of Richard II (1377-1399); and the armor of England was practically the same, in general style at least, as that used on the Continent.

The increased skill in tempering steel and making weapons was a powerful factor in the change from mail to plate armor. The best blades of two-handed swords and battle axes would cut through the ordinary chain armor; and point-blank fire from the longbow and arbalest, striking against parts covered only with chain mail, was likely to disable the man-at-arms by the stunning effect of the impact, even if the missile failed to penetrate the armor. Highly tempered steel plates, while heavy and cumbersome, would turn the ordinary sword stroke and arrow point, and this advantage gradually outweighed the objections; but nevertheless there was a constant search for some substitute substance to take the place of steel.

One of the first substances tried for this purpose, and the one that perhaps more nearly approached steel in the protection afforded, was leather prepared in a peculiar method by boiling; but it proved entirely inadequate.

Leg protection, in the form of metal plates, had begun early in the thirteenth century, altho knee caps had been used much before that time on account of the vulnerability of the knee joint. The greave, or rigid fitting gaiter, came into use at least as early as the fourteenth century, first made of leather, and later of steel. Shortly after this followed the steel thigh piece, hinged knee-caps, and solleret or jointed steel shoe. As the knight fought mostly on horseback these sollerets were often drawn out to long fantastic points. One still to be seen at Warwick measures thirty-two and one-half inches from tip to spur.

On foot the steel-clad man-at-arms was now practically invulnerable to attack, but the weight of his armor usually prevented him from getting within striking distance of lightly clad troops. Moreover, he was soon exhausted, and when toppled over became at once a victim of lead mallets or clubs. If he mounted, a few arrows soon brought down his charger, which was still vulnerable even if his rider was not. Crecy and Agincourt had been thus won.

It was for this reason that attempts were made to devise satisfactory protective armor for the horse as well as his rider. Breast protection and headpieces for horses had been long in use, but there were still numerous vulnerable points easily found by skilful archers. Body plates were tried, therefore, hung about the flanks and breast like a skirt, flaring at the bottom to give room for movements of the horse's legs, and jointed steel leg pieces were tried for the forelegs. But when so equipped and weighted down by armor and rider, the horse could move little faster than a footman, and even in the most complete horse armor there were still vulnerable points. As a compromise, therefore, the man-at-arms gave up

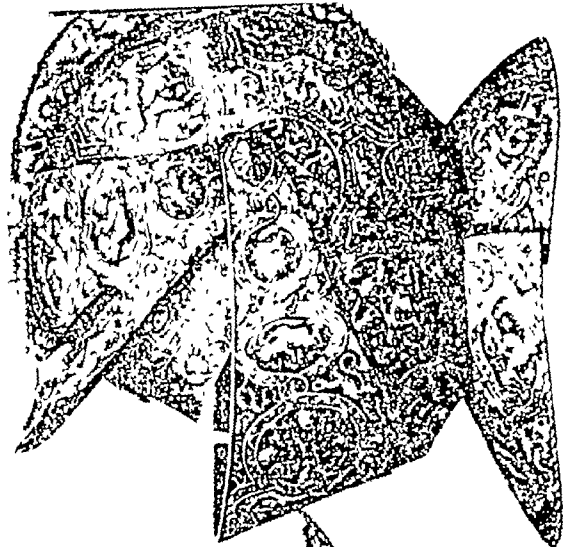
the idea of protecting his steed, frequently using him only as a means of rapid transportation, and like the modern mounted infantrymen, dismounting and fighting on foot.

In various other ways the knight increased his efficiency as a fighting man, particularly in the fifteenth century, when jointed plate armor was perfected by numerous overlapping plates and sliding rivets, which added to the flexibility of the suit so that the cumbersome cloth padding and heavy chain mail formerly worn under the armor were no longer necessary. Such a knight on foot was relatively active, and his suit of highly tempered steel was a marvel of mechanical perfection. A suit of such armor worn by Henry VIII, now exhibited in the Tower of London, is made of two hundred and thirty-five separate pieces of metal, and while weighing ninety-two pounds, is of sufficient flexibility to allow active movements when worn by a muscular man.

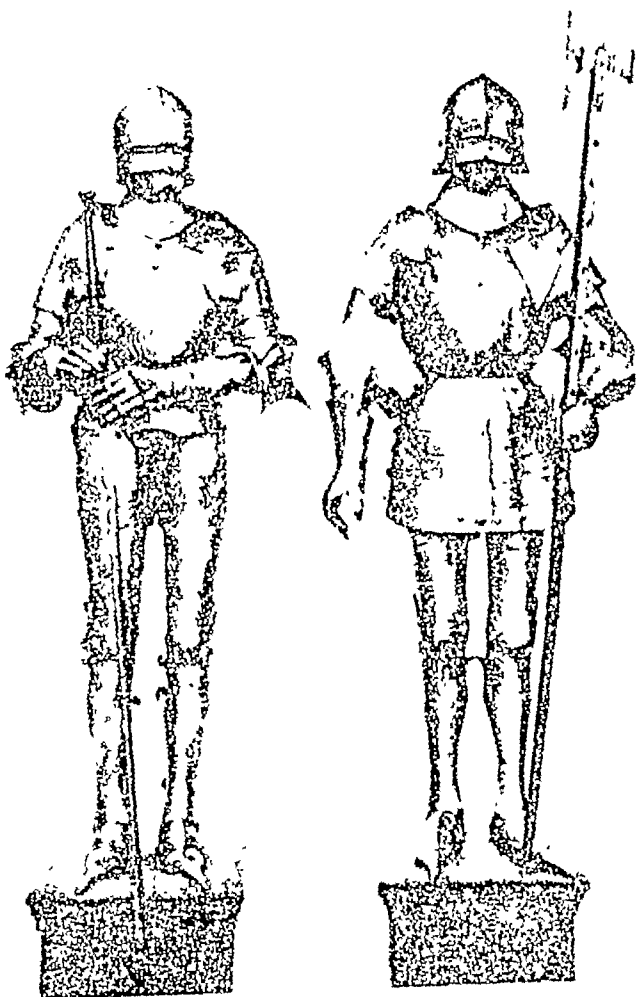
By the time of this triumph in armor-making, however, firearms such as pistols and muskets were coming into use, against which no armor afforded protection. "The wheel-lock pistol, the arm of the German Reiters, who wore black armor, mail sleeves, and a visored morion, was in the field in 1512," says Gardner. "From this time, therefore, armor was worn rather for display than service, and the purchaser came to value its defensive qualities far less than the magnificence of its decoration."



A PRIZE-WINNING HELMET









OF THE SIXTEENTH CENTURY



FORTIFIED MEDIEVAL CASTLE

XVII

MILITARY FORTIFICATIONS OF THE MIDDLE AGES

PERHAPS nothing is more striking in the general decadence of Western Europe in the Middle Ages than the decline in the building of fortified towns, castles, and fortresses. This is made more striking by a contrast with the structures of massive masonry built by the Romans shortly before, and still scattered over Europe at that time.

One would suppose that these remains would have been a constant object lesson to early medieval architects. But instead of profiting by the examples of such magnificent and impregnable structures, the builders of military fortifications of the early Middle Ages contented themselves for several centuries with crude mounds and palisades of stakes, sometimes with stone structures in the center enclosure.

Where Roman structures still existed they were, of course, utilized; but in cases where they were out of repair, the breach, if extensive, was frequently patched up with palisaded earthworks rather than masonry.

The explanation of this lax condition in fortification building is probably the very simple one that heavy fortifications were unnecessary as long as defense was needed only against attacks of barbarian hordes who knew little of siegecraft.

By the middle of the tenth century, however, the necessity for better fortifications began to be felt. New



enemies, skilled in the art of besieging, had appeared in Western Europe. Simple mounds and stockades could not withstand the attacks of such warriors as Saracen and Viking; and to repel these enemies many ancient Roman walls were repaired with masonry and used as models for new fortresses.

As a result, castles and towns with huge towers, walls, and moats became common all over Western Europe, whose proportions and strength were equal to their prototypes of Greece, Rome, or Byzantium.

There were many steps in the process of evolution before the stockaded mound finally developed into the great stone medieval castle. One of the first was the substitution of stone for the wooden stockade, thus forming a formidable "shell" around an enclosure, within which buildings of wood or stone could be constructed. A thick-walled, high, windowless tower, or keep, within this protecting wall gave added safety. This was the "shell keep" of the tenth and eleventh centuries. From this the great walled castles of late medieval time developed, having two or three series of walls enclosing massive structures.

William the Conqueror, upon his occupation of England in 1066, found it necessary to erect many great castles for his vassals in order to hold his conquered territory. The most famous of these strongholds is the Tower of London. But this should not be taken as a typical example of the Conqueror's castles. For most of those erected by him were comparatively frail structures built on the sites of old Saxon strongholds, and in many instances they were constructed of loose stone and wood.

The Tower of London is doubtfully supposed to have been erected on the site of one of Julius Cæsar's fortresses. It is certain that the Tower represents the best

type of architecture of the Norman conqueror. The great keep of the Tower rises to a height of ninety feet in the form of a rectangle, with a base of one hundred and seven by one hundred and eighteen feet. The walls are fifteen feet thick at the base, and ten to eleven feet in the upper stories.

Against such a fortress almost windowless and with practically no wooden structures inside, the Western military engines of the time of William could accomplish very little. Only two methods of capturing such a stronghold were then possible—by starving out the garrison, or by mining. Any attempt at assault would be hopeless, as the entrance was only a small one situated several feet above the ground. In the case of the Tower and similar structures, mining was impossible because of the deep moat, so that the capture of such castles depended largely upon treachery within, or protracted sieges and starvation.

If, however, such towers were not unduly massive and without a wide moat, an enemy with the bore or "cat" could sometimes penetrate the early straight-walled fortress with comparative ease, before the invention of the brattice, or bastion, as the soldiers on the walls of such castles, while attempting to throw missiles upon the besiegers, must expose themselves to the enemy.

The brattice was a wooden structure built along the top of the wall and projecting beyond it. The soldiers standing upon this could shoot and drop missiles directly down upon the men about the cat, being protected meanwhile by the wooden sides.

Later these wooden brattices were replaced by stone bartizans, which not only afforded greater protection, but could not be burned by combustibles attached to arrows and arbalest bolts.

Like so many other improvements in things military, however, the highest state of perfection in fortress making did not become known in Western and Central Europe until learned through the disastrous experiences of the Crusaders. To the military architects of the West the fortresses constructed by the Byzantines were revelations. They were arranged as central structures of solid masonry, surrounded by two or three concentric walls, these walls being further strengthened by towers set in at intervals and commanding the intervening "curtain" of the wall.

The most perfect of these structures were the fortifications of Constantinople. These fortifications were formed of three concentric walls, the outermost one surrounded by a deep ditch. The second wall overtopped the first, and this in turn was overtopped by the third, the space beyond the ditch thus being commanded by three separate battlements. But besides the battlements, the two outer walls had an arrangement of port-holes, so that the attacking party was exposed to six separate lines of defenders, each having a clear field for the discharge of missiles.

The city was thus absolutely impregnable to attack from without until the days of gunpowder; and it was never captured, except by treachery from within, until 1204, when a negligent and degenerate emperor allowed his fleet to deteriorate, thus exposing the sea wall to the Venetian war vessels.

If Western military architects had been slow in developing their architecture at home, they were not so in utilizing the experiences of the returning Crusaders, and by the end of the twelfth century Western castles and fortresses easily rivaled the Eastern structures. Perhaps the strongest and best fortress of the day was

planned and built by Richard the Lion-Hearted. This was the Chateau Gaillard, a fortress built on an unapproachable piece of rising ground, connected with the surrounding elevations only by a narrow isthmus of land. The single accessible side was protected by four walls, each commanding the one before it.

This castle was, however, captured by King Philip Augustus on March 6, 1204, after a desperate resistance extending over many months, tho the garrison was a mere handful of men. Even then the place would probably not have fallen had not the starving condition of the defenders induced them rashly to attempt to cut their way out through the besiegers.

The highest perfection in this most invulnerable style of medieval castle was reached in the thirteenth century in Western Europe. To be sure, successive generations made alterations and minor improvements; but the general type — the keep surrounded by concentric walls enclosing inner, middle, and outer walls — was little altered. Probably the best example of this type in Great Britain is Cærphilly, in South Wales; but undoubtedly the most famous is the Tower of London. As built by William the Conqueror this castle was not of the concentric type, but the massive keep made a good nucleus around which concentric curtain walls were placed, so that as it stands today it is a complete example of this style of military architecture.





XVIII

THE INTRODUCTION OF FIREARMS

A NEW epoch of scientific warfare began with the introduction of firearms. Heretofore the various forms of armor and body protection worn by different soldiers had paramount importance. From the moment that the perfection of firearms had reached the stage where cannon, muskets, and pistols came into use, the body armor became obsolescent—to be followed into the scrap heap by such weapons as bow, spear, and sword. The sword, and the pike in the modified form of the bayonet—also the lance—are still in use, to be sure, but they play an unimportant part in modern warfare.

The invention of gunpowder is a mystery and the time of its introduction into warfare is wrapped in obscurity. As an explosive some mixture resembling gunpowder had been known for many centuries before its employment as a propelling agent. Even the ancients are thought by some to have been familiar, not only with the explosive qualities of such a substance, but also with its use for projecting missiles. The obscurity of the writings which are the foundations of such beliefs, however, and the different interpretations that may be given them, make any positive assertion that gunpowder, as a propelling agent, was known before the late Middle Ages untenable.

For example, Virgil tells of Salmoneus, king of Elis, who was slain by Jupiter for his audacity in attempting to imitate thunder and lightning. By some this is thought



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to show that Salmoneus had discovered some explosive compound like gunpowder, and was killed by an accidental explosion, his death being interpreted as a punishment of the god of thunder. Dion Cassius in his *History of Rome* tells of engines used by Caligula which imitated thunder and lightning and hurled stones. Alexander the Great is thought by certain authors to have encountered firearms in his Indian campaign; and Archimedes is credited with having employed something resembling gunpowder among the other ingenious methods invented, or adapted, by him in the defense of Syracuse.

But all these alleged sources are lacking in sufficient proof. There is a great confusion in the interpretations of the ancient and medieval literature on the subject, and it is easily supposable that many of the references interpreted as meaning explosives or propelling agents, really refer to substances like Greek fire, a description of which might easily be construed as a description of gunpowder.

The Chinese were long credited with having first invented gunpowder, and it is probable that some explosive mixture was known to them for many centuries before it was known in Europe. They did not utilize this knowledge in producing engines for propulsion, however, and their knowledge of an explosive, if they possessed such knowledge, plays no part in the history of firearms.

It is probable that gunpowder was used in war in the form of rockets or shells some time before it was used as a propelling agent. The Arabs are supposed to have used it in this manner, and a document still in existence, written in 1250, describes such weapons. Ferabius, a Spanish monk and a contemporary of Roger Bacon, wrote a treatise on Greek fire, rockets, and "thunder"

which is still preserved in the Bodleian Library at Oxford; and it was possibly from this source that Roger Bacon became acquainted with some compound which he described, and which he is sometimes credited with having invented. It seems more likely, however, that his knowledge was obtained from the Arabs.

But the mere invention of gunpowder, as such, is of little importance compared with its application to firearms as a propellant. This use seems to have been first made either by the Moors or Saracens. Ismail, king of Granada, is believed to have used cannon at the siege of Baza in 1325; but probably the first reliable contemporary account of this use is a document still in existence, written in 1326. This document, altho not describing the actual use of firearms, refers to their manufacture specifically in a manner quite unequivocal.

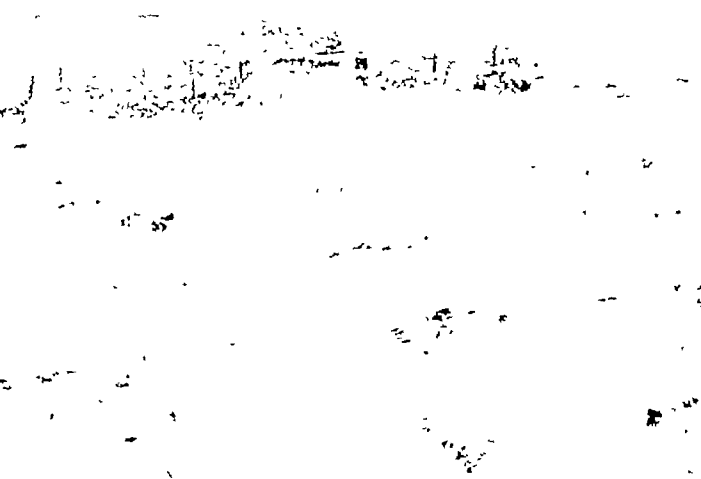
It is certain, therefore, that by the time of the battle of Crecy, in 1346, firearms were known, and there is some ground for believing that the English used cannon at that battle. It is certain, however, that any part played by cannon in determining the issue at Crecy was a minor one.

It is equally certain that by the end of the fourteenth century cannon had become recognized weapons of warfare, and the development of small arms in the form of hand-cannon is known to have kept pace with the development of the heavier weapons.

It is an interesting fact that most of the early cannon, and possibly all of them, were breech-loaders; yet these were quickly replaced by muzzle-loading cannon, and the system of breech-loading was not reintroduced to any extent until after the middle of the nineteenth century. The breech mechanism of the early cannon was so clumsy and unsatisfactory that once the muzzle-loader

came into use it held its place, practically without alteration, for over three centuries.

The first cannon were not, as a rule, made of a single piece of metal, cast or bored to the proper shape, but were made of strips of metal fastened together by hoops of iron. Sometimes other substances, such as leather, were tried, and such cannon, made with metal tubes wound with leather, were used successfully by Gustavus Adolphus. But such experiments soon proved unsatisfactory, and iron cannon came gradually into general use. And with this came the new era of scientific warfare, the record of which has been graphically presented even if anachronistically in our pages in a pictorial pageant that perhaps needs no further textual commentary.



ALL QUIET ALONG THE WESTERN FRONT

